Test sheet : KHD

: 21.09.92 Edition

Replaces

Test oil : ISO-4113

Combination no. : D 401 840 754AA

Injection pump

Pump designation : PE12P110A920LS3173

EP type number : 0 411 810 708

Governor

Governor design. : RQV300...1150PA820

Governer no. : 0 421 813 561

Customer-spec. information

Customer : KHD

Engine : BF12L513C

1st version kW : 367.0

: 2300 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

**Opening** 

pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter x Wall thickness

x Length mm : 6.00x1.50x600

(A) Injection pump setting values

Insp. values in parentheses Set equal delivery quant.

per values \_\_\_

BEGINNING OF DELIVERY

Prestroke mm : 2.80...2.90

: (2.75...2.95)

Rack travel in mm : 9.00...12.00

Firing order : 1- 4- 9- 8- 5- 2Phasing : 0-15-60-75-120-135-

180-195-240-255-300-

315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1150

Rack travel in mm : 12.00...12.10

Del.quantity cm3/: 14.7...14.9

100 s: (14.4...15.1)

cm3 : 0.4Spread

100 s: (0.7)

rpm : 300.02nd speed Rack travel in mm: 6.4...6.6

Del.quantity cm3/: 1.4...2.0

100 s: (1.1...2.2) cm3 : 0.4 Spread

100 s: (0.7)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300

: 1.20...1.40 travel mm rpm : 380 2nd speed

: 2.30...2.60 travel mm

3rd speed rpm : 800

: 5.20...5.50 travel mm

rpm : 1200 4th speed

travel mm : 8.50...8.70

5th speed : 1280 rpm

travel mm : 9.30...9.60

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

Speed rpm : 1190

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

Aneroid pressure h: 860

Del.quantity : 147.0...151.5)

Spread

cm3 : 4.00

1000 : (7.50)

RATED SPEED

1st version

Control lever

position degrees: 117...125

Testing:

1st rack travel in: 11.00

rpm : 1190 ... 1200 Speed

2nd rack travel in: 5.50

Speed rpm : 1260...1290 4th rack travel in: 1400

Speed rpm : 0.00...1.00

LOW IDLE 1

Control Lever

position degrees: 81...89

Testina:

Speed rpm : 100 Minimum rack trave: 8.00

Speed rom : 300

Rack travel in mm : 6.40...6.60

CONSTANT REGULATION

rpm : 300...450 Speed

TORQUE CONTROL

Dimension a mm

Torque control curve - 1st version

1st speed rpm : 1150

Rack travel in m: 12.00...12.10

2nd speed rpm : 650

Rack travel in m: 12.00...12.20

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed riphi : 450 Pressure hPa : 860

Rack travel mm : 12.00...12.10

Measurement

1/min: 450 Speed

1st pressure hPa : -

Rack travel in m: 10.60...10.80

2nd pressure hPa : 370

Rack travel in m: 11.70...11.80

3rd pressure hPa : 250

Rack travel in m: 10.90...11.10

START CUT-OUT

Speed

1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

Speed rpm : 450

Del.quantity cm3/: 108.0...112.0

1000 s: (105.5...114.5)

**BREAKAWAY** 

1st version

1mm rack travel less than

fuli load rack tr: 11.00

rpm : 1190...1200 Speed

STARTING FUEL DELIVERY

Speed rom : 100

Del.quantity cm3/: 135.0...165.0

1000 s: (131.0...169.0)

Remarks:

Check electrically unlatched starting

fuel delivery (EES) with 24 volt.

On activation of the starting solenoid, the start position must be reached.

: KHD Test sheet

Edition : 21.09.92

Replaces

Test oil : ISO-4113

Combination no. : 0 401 840 754AB

Injection pump

Pump designation : PE12P110A920LS3173

EP type number : 0 411 810 708

Governor

Governor design. : RQV300...1150PA820

: 0 421 813 561 Governer no.

Customer-spec, information

Customer : KHD

Engine : BF12L513C

1st version kW : 348.0

: 2300 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

Opening

pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter

x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Prestroke mm : 2.80...2.90

: (2.75...2.95)

Rack travel in mm : 9.00...12.00

Firing order : 1- 4- 9- 8- 5- 2-

Phasing : 0-15-60-75-120-135-180-195-240-255-300-

315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed riom: 1150

Rack travel in mm : 11.50...11.60

Del.quantity cm3/: 13.7...13.9

100 s: (13.4...14.1)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 300.0

Rack travel in mm : 6.4...6.6

Del.cuantity cm3/: 1.4...2.0 100 s: (1.1...2.2)

Spread cm3 : 0.4

100 s: (0.7)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300

: 1.20...1.40 travel mm

2nd speed rpm : 380

travel mm 2.30...2.60

3rd speed : 800 rpm

5.20...5.50 travel mm

: 1200 4th speed rpm

travel mm : 8.50...8.70

5th speed rpm : 1280

: 9.30...9.60 travel mm

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

rpm : 1190 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

Aneroid pressure h: 800

: 137.0...139.0 Del.quantity

1000 : (134.5...141.5)

Spread

cm3: 4.00

1000 : (7.50)

RATED SPEED

1st version

Control lever

position degrees: 117...125

Testing:

1st rack travel in: 10.50

rpm : 1190...1200 Speed

2nd rack travel in: 5.50

rpm : 1260...1290 Speed

4th rack travel in: 1400

rpm : 0.00...1.00Speed

LOW IDLE 1

Control lever

position degrees: 81...89

Testing:

: 100 Speed rpin

Minimum rack trave: 8.00 Speed

rpm : 300 Rack travel in mm : 6.40...6.60

CONSTANT REGULATION

Speed rpm : 300...450

TORQUE CONTROL

Dimension a mm :-

Torque control curve - 1st version

1st speed rpm : 1150

Rack travel in m: 11.50...11.60

rpm : 650 2nd speed

Rack travel in m: 11.50...11.70

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed : 450 rom

hPa : 800

Rack travel mm : 11.50...11.60

Measurement

Speed 1/min : 450

1st pressure hPa : -

Rack travel in m: 10.60...10.80

2nd pressure hPa : 300

Rack travel in m: 11.30...11.40

3rd pressure hPa : 235

Rack travel in m: 10.80...11.00

START CUT-OUT

Speed

1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

Speed rpm : 450 Del.quantity cm3/ : 108.0...112.0

1000 s: (105.5...114.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.50

Speed rpm : 1190...1200

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 135.0...165.0

1000 s: (131.0...169.0)

Remarks:

Check electrically unlatched starting

fuel delivery (EES) with 24 volt.

On activation of the starting solenoid, the start position must be reached.

Test sheet : KHD

Edition : 21.09.92

Replaces : -

Test oil : ISO-4113

Combination no. : 0 401 840 754AC

Injection pump

Pump designation : PE12P110A920LS3173

EP type number : 0 411 810 708

Governor

Governor design. : RQV300...1150PA820

Governer no. : 0 421 813 561

Customer—spec. information

Customer : KHD

Engine : BF12L5130

1st version kW : 333.0

Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

Opening

pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter

x Wall thickness

x Length mm : 6.00x1.50x600

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Prestroke mm : 2.80...2.90

: (2.75...2.95)

Rack travel in mm : 9.00...12.00

Firing order : 1-4-9-8-5-2-

Phasing

: 0-15-60-75-120-135-

180-195-240-255-300-

315

Tolerance  $+ - ^{\circ} : 0.50 (0.75)$ 

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1150

Rack travel in mm : 11.20...11.30

Del.quantity cm3/: 13.3...13.5

100 s: (13.0...13.7)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 300.0

Rack travel in mm : 6.4...6.6

Del.quantity cm3/: 1.4...2.0 100 s: (1.1...2.2)

Spread cm3: 0.4

100 s: (0.7)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 1.20...1.40

2nd speed rpm : 380

travel mm : 2.30...2.60

3rd speed rpm: 800

travel mm : 5.20...5.50

4th speed rpm : 1200

travel mm : 8.50...8.70

5th speed rpm : 1280

travel mm : 9.30...9.60

GUIDE SLEEVE POSITION

Control-lever position
Degree: -1

Speed rpm: 1190

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm: 1150

Aneroid pressure h: 700

Del.quantity : 133.0...135.0

1000 : (130.5...137.5)

Spread cm3 : 4.00

1000 : (7.50)

RATED SPEED

1st version Control lever

position degrees: 117...125

Testing:

1st rack travel in: 10.20

Speed rpm : 1190...1200 2nd rack travel in: 5.50

Speed rpm : 1250...1280 4th rack travel in: 1400

rpm : 0.00...1.00Speed

LOW IDLE 1

Control Lever

position degrees: 81...89

Testing:

Speed : 100 man Minimum rack trave: 8.00 : 300 Speed rpm

Rack travel in mm : 6.40...6.60

CONSTANT REGULATION

Speed rpm : 300...450

TORQUE CONTROL

Dimension a mm

Torque control curve - 1st version

1st speed rpm : 1150

Rack travel in m: 11.20...11.30

2nd speed rpm : 650

Rack travel in m: 11.20...11.40

Aneroid/Altitude Compensator Test

1st version

Settina

Speed rpm : 450 hPa : 700 Pressure

Rack travel mm : 11.20...11.30

Measurement

1/min: 450 Speed

1st pressure hPa : -

Rack travel in m: 10.60...10.80

2nd pressure hPa : 250

Rack travel in m: 11.00...11.10

3rd pressure hPa : 215

Rack travel in m: 10.70...10.90

START CUT-OUT

1/min : 220 (240) Sp∈ed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

Speed rpm : 450 Del.quantity cm3/ : 108.0...112.0 1000 s: (105.5...114.5)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 10.20

rpm : 1190...1200 Speed

STARTING FUEL DELIVERY

Speed man : 100

Del.quantity cm3/: 135.0...165.0

1000 s: (131.0...169.0)

Remarks:

Check electrically unlatched starting fuel delivery (EES) with 24 volt.

On activation of the starting solenoid, the start position must be reached.

Test sheet : KHD

Edition : 21.09.92

Replaces

Test oil : ISO-4113

Combination no. : 0 401 840 754AD

Injection pump

Pump designation : PE12P110A920LS3173

: 0 411 810 708 EP type number

Governor

Governor design. : RQV300...1150PA820

: 0 421 813 561 Governer no.

Customer-spec. information Customer : KHD

Engine : BF12L5130

1st version kW : 330.0 : 2300 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

Test Lines : 1 680 750 015

Outside diameter

x Wall thickness

x Length mm : 6.00x1.50x600

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Prestroke mm : 2.80...2.90

: (2.75...2.95)

Rack travel in mm : 9.00...12.00

Firing order : 1- 4- 9- 8- 5- 2-

Phasina : 0-15-60-75-120-135-

180-195-240-255-300-

315

: 0.50 (0.75) Tolerance + - \*

Time to cyl. no. : 1

BASIC SETTING

1st speed rom: 1150

Rack travel in mm: 11.10...11.20

Del.quantity cm3/: 13.1...13.3

100 s: (12.8...13.5)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 300.0

Rack travel in mm: 6.4...6.6 Del.quantity cm3/: 1.4...2.D

100 s: (1.1...2.2)

cm3 : 0.4Spread

100 s: (0.7)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300

: 1.20...1.40 travel mm

2nd speed

rpm : 380 : 2.30...2.60 travel mm

3rd speed rpm : 800

travel mm : 5.20...5.50

4th speed rpm : 1200

travel mn: : 8.50...8.70

5th speed rpm : 1280

travel mm : 9.30...9.60

GUIDE SLEEVE POSITION

Control-lever position Degree: -1

rpm : 1190 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150 Aneroid pressure h: 700

Del.quantity : 131.0...133.0

1000 : (128.5...135.5)

cm3 : 4.00 Spread

1000 : (7.50)

RATED SPEED

1st version Control lever

position degrees: 117...125

Testing:

1st rack travel in: 10.10

Speed rpm : 1190...1200

2nd rack travel in: 5.50

rpm : 1250...1280 Speed

4th rack travel in: 1400

rpm : 0.00...1.00 Speed

LOW IDLE 1

Control lever

position degrees: 81...89

Testing:

Speed : 100 rpm Minimum rack trave: 8.00

rpm : 300

Rack travel in mm : 6.40...6.60

CONSTANT REGULATION

rpm : 300...450 Speed

TORQUE CONTROL

Dimension a mm

Torque control curve - 1st version

1st speed rpm : 1150

Rack travel in m: 11.10...11.20

2nd speed rpm : 650

Rack travel in m: 11.10...11.30

Aneroid/Altitude

Compensator Test

1st version

Setting

: 450 Speed rom hPa : 690 Pressure

Rack travel mm : 11.10...11.20

Measurement

1/min: 450 Speed

1st pressure hPa : -

Rack travel in m: 10.60...10.80

2nd pressure hPa : 250

Rack travel in m: 11.00...11.10 3rd pressure hPa : 215

Rack travel in m: 10.70...10.90

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

Speed rpm : 450

Del.quantity cm3/: 108.0...112.0

1000 s: (105.5...114.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.10

Speed rpm : 1190...1200

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 135.0...165.0 1000 s: (131.0...169.0)

Remarks:

Check electrically unlatched starting fuel delivery (EES) with 24 volt.

On activation of the starting solenoid, the start position must be reached.

Test sheet : KHD

Edition : 21.09.92

Replaces

Test oil : ISO-4113

Combination no. : 0 401 840 754AE

Injection pump

Pump designation : PE12P110A920LS3173

EP type number : 0 411 810 708

Governor

Governor design. : RQV300...1150PA820

Governer no. : 0 421 813 561

Customer-spec. information

Customer : KHD

Engine : BF12L5130

1st version kW : 320.0

Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Openina

pressure, bar : 172...175

Test Lines : 1 680 750 015

Outside diameter

x Wall thickness

x Length mm : 6.00x1.50x600

(A) Injection pump setting values

Insp. values in parentheses

Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Prestroke mm : 2.80...2.90

: (2.75...2.95)
Rack travel in mm : 9.00...12.00

: 1- 4- 9- 8- 5- 2-Firing order

**A09** 

Phasing : 0-15-60-75-120-135-

180-195-240-255-300-

315

: 0.50 (0.75) Tolerance + - °

Time to cyl. no. : 1

BASIC SETTING

1st speed riom: 1150

Rack travel in mm : 10.70...10.80

Del.quantity cm3/: 12.6...12.8

100 s: (12.3...13.0)

Spread cm3 : 0.4

100 s: (0.7)

rpm : 300.0 2nd speed

Rack travel in mm: 6.4...6.6 Del.quantity cm3/: 1.4...2.0

100 s: (1.1...2.2)

cm3 : 0.4Spread

100 s: (0.7)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

rpm : 300 1st speed

1.20...1.40 travel mm

380 2nd speed rom :

: 2.30...2.60 travel mm

3rd speed rpm : 800

: 5.20...5.50 travel mm

4th speed rom : 1200

travel mm : 8.50...8.70

rpm : 1280 5th speed

travel mm : 9.30...9.60

GUIDE SLEEVE POSITION Control-Lever position

Degree: -1

rpm : 1190 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

rpm : 1150

Del.quantity : 120.0...120.5 1000 : (123.5...130.5)

Spread cm3 : 4.00

1000 : (7.50)

RATED SPEED

1st version Control lever

position degrees: 117...125

Testing:

1st rack travel in: 9.70

rpm : 1190...1200 Speed

2nd rack travel in: 5.50 Speed rpm : 1240...1270 4th rack travel in: 1400

Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever position degrees: 81...89

Testing:

Speed : 100 rpm Minimum rack trave: 8.00 Speed : 300 rpm

Rack travel in mm : 6.40...6.60

CONSTANT REGULATION

rpm : 300...450 Speed

TORQUE CONTROL

Dimension a mm : -

Torque control curva - 1st version

1st speed rpm : 1150

Rack travel in m: 10.70...10.80

2nd speed rpm : 650

Rack travel in m: 10.70...10.90

START CUT-OUT

Speed 1/min : 220 (240)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 9.70

rpm : 1190...1200 Speed

STARTING FUEL DELIVERY

Speed : 100 rom

Del.quantity cm3/: 135.0...165.0 1000 s: (131.0...169.0)

Remarks:

On activation of the starting solenoid, the start position must be reached.

A10

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet

: KHD

Edition

: 21.09.92

Replaces

Test oil

: ISO-4113

Combination no. : 0 401 840 754AF

Injection pump

Pump designation : PE12P110A920LS3173

EP type number

: 0 411 810 708

Governor

Governor design. : RQV300...1150PA820

Governer no.

: 0 421 813 561

Customer-spec. information

Customer

: KHD

Engine

: BF12L5130

1st version

: 300.0

Rated speed

: 2300

TEST BENCH REQUIREMENTS

kW

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly

: 0 681 343 009

Opening

pressure, bar

: 172...175

Test lines

: 1 630 750 015

Outside diameter

x Wall thickness

x Length mm

: 6.00x1.50x600

(A) Injection pump setting values

Insp. values in parentheses

Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Prestroke mm

: 2.80...2.90

: (2.75...2.95)

Rack travel in mm : 9.00...12.00

Firing order

: 1- 4- 9- 8- 5- 2-

A11

11- 10- 3- 6- 7- 12

Phasing

: 0-15-60-75-120-135-

180-195-240-255-300-

315

Tolerance + - °

: 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed

rpm: 1150

Rack travel in mm : 10.30...10.40

Del.quantity cm3/: 11.6...11.8

100 s: (11.3...12.0)

Spread

2nd speed

cm3 : 0.4

100 s: (0.7)

rpm : 300.0

Rack travel in mm: 6.4...6.6

Del.quantity cm3/: 1.4...2.0 100 s: (1.1...2.2)

Spread

cm3 : 0.4

100 s: (0.7)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

1st speed

travel imi

rpm : 300 1.20...1.40

2nd speed

rom 380

travel mm

: 2.30...2.60

3rd speed

rpm : 800

travel mm

: 5.20...5.50

4th speed travel mm rom : 1200 : 8.50...8.70

5th speed

: 1280 rpm

travel mm

: 9.30...9.60

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1190

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

Speed

Del.quantity

rpm : 1150

: 116.0...118.0

1000 : (113.5...120.5)

Spread

cm3 : 4.00

1000 : (7.50)

## RATED SPEED

1st version

Control lever

position degrees: 117...125

Testing:

1st rack travel in: 9.30

Speed rpm : 1190...1200

2nd rack travel in: 5.50

Speed rpm : 1140...1170

4th rack travel in: 1400

Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever

position degrees: 81...89

Testing:

Speed rpm : 100

Minimum rack trave: 8.00 Speed rpm : 300

Rack travel in mm : 6.40...6.60

CONSTANT REGULATION

Speed rpm : 300...450

TORQUE CONTROL

Dimension a mm : 0.40

Torque control curve - 1st version

1st speed rpm : 1150

Rack travel in m: 10.30...10.40

2nd speed rpm : 650

Rack travel in m: 10.30...10.50

START CUT-OUT

Speed 1/min: 220 (240)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.30

Speed rpm : 1190...1200

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 135.0...165.0

1000 s: (131.0...169.0)

Remarks:

On activation of the starting solenoid, the start position must be reached.

A12

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : KHD

Edition : 21.09.92

Replaces

Test oil : ISO-4113

Combination no. : 0 401 840 754AG

Injection pump

Pump designation : PE12P110A920LS3173

: 0 411 810 708 EP type number

Governor

Governor design. : RQV300...1150PA820

: 0 421 813 561 Governer no.

Customer-spec. information Customer : KHD

Engine : BF12L513C

1st version kW : 324.0

: 2300 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 0 631 343 009 assembly

Opening.

pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter

x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

: 2.80...2.90 Prestroke mm

: (2.75...2.95)

Rack travel in mm : 9.00...12.00

: 1- 4- 9- 8- 5- 2-Firing order

11- 10- 3- 6- 7- 12

Phasing : 0-15-60-75-120-135-

180-195-240-255-300-

315

: 0.50 (0.75) Tolerance + - \*

Time to cyl. no. : 1

BASIC SETTING

rpm: 1150 1st speed

Rack travel in mm : 11.00...11.10

Del.quantity cm3/: 12.9...13.1

100 s: (12.6...13.3)

Spread cm3 : 0.4

100 s: (0.7)

rpm : 300.0 2nd speed

Rack travel in mm: 6.4...6.6 Del.quantity cm3/: 1.4...2.0

100 s: (1.1...2.2)

cm3 : 0.4Spread

100 s: (0.7)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 1.20...1.40

2nd speed 380 rpm

2.30...2.60 travel mm 3rd speed : 800 COM

travel mm

: 5.20...5.50

4th speed rpm : 1200

travel mm : 8.50...8.70

5th speed rpm : 1280

: 9.30...9.60 travel mm

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

rpm : 1190 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

Del.quantity : 129.0...131.0

1000 : (126.5...133.5)

Spread cm3

: 4.00 1000 : (7.50)

## RATED SPEED

1st version Control lever

position degrees: 117...125

Testina:

1st rack travel in: 10.00

rpm : 1190...1200 Speed

2nd rack travel in: 5.50

rpm : 1250...1280 Speed

4th rack travel in: 1400

rpm : 0.00...1.00Speed

LOW IDLE 1

Control lever

position degrees: 81...89

Testing:

Speed rpm : 100 Minimum rack trave: 8.00

: 300 Speed rpm

Rack travel in mm : 6.40...6.60

CONSTANT REGULATION

rpm : 300...450 Speed

TORQUE CONTROL

Dimension a mm

Torque control curve - 1st version

1st speed rpm : 1150

Rack travel in m: 11.00...11.10

2nd speed rpm : 650

Rack travel in m: 11.00...11.20

START CUT-OUT

1/min : 220 (240) Speed

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 10.00

Speed rpm : 1190...1200

STARTING FUEL DELIVERY

Speed : 100 rpm

Del.quantity cm3/: 135.0...165.0 1000 s: (131.0...169.0)

Remarks:

:

On activation of the starting solenoid, the start position must be reached.

A14

# BOSCH INU. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : KHD

Edition : 21.09.92

Replaces : -

Test oil : ISO-4113

Combination no. : 0 401 840 755AA

Injection pump

Pump designation : PE12P110A920LS3173

EP type number : 0 411 810 708

Governor

Governor design. : RQV750PA823 Governor no. : 0 421 813 573

Customer-spec. information

Customer : KHD

Engine : BF12L513C

1st version kW : 276.0 Rated speed : 1500

TEST BENCH REQUIREMENTS

Test oil

inlet temp. \*C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

Opening

pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter

x Wall thickness

x Length mm : 6.00x1.50x600

(A) Injection pump setting values Insp. values in parentheses

Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Prestroke mm : 2.80...2.90

: (2.75...2.95)

Rack travel in mm : 9.00...12.00

Firing order : 1- 4- 9- 8- 5- 2-

11- 10- 3- 6- 7- 12

Phasing : 0-15-60-75-120-135-

180-195-240-255-300-

315

Tolerance  $+ - ^{\circ} : 0.50 (0.75)$ 

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 700

Rack travel in mm: 12.00...12.10

Del.quantity cm3/: 14.7...14.9

100 s: (14.4...15.1)

Spread cm3: 0.4

100 s: (0.7)

2nd speed rpm : 300.0

Rack travel in mm : 6.6...6.8 Del.quantity cm3/ : 1.5...2.1

100 s: (1.2...2.3)

Spread cm3 : 0.4

100 s: (0.7)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm: 700

Del.quantity : 147.0...149.0 1000 : (144.5...151.5)

Spread cm3 : 4.00

1000 : (7.50)

RATED SPEED

1st version

Control lever

position degrees: 86...94

Testing:

1st rack travel in: 11.00

Speed rpm : 748...753

2nd rack travel in: 5.50

Speed rpm : 780...787

4th rack travel in: 820

Speed rpm : 0.00...1.00

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 11.00 Speed rpm : 748...753

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 140.0...160.0 1000 s: (136.0...164.0)

Remarks:

Check electrically unlatched starting fuel delivery (EES) with 24 volt.

On activation of the starting solenoid, the start position must be reached.

**APPLICATION** 

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet

: KHD Edition : 31.08.92

Replaces

Test oil : ISO-4113

Combination no. : 0 401 840 755AB

Injection pump

Pump designation : PE12P110A920LS3173

EP type number : 0 411 810 702

Governor

Governor design. : RQV750PA823 Governer no. : 0 421 813 573

Customer-spec. information Customer : KHD

Engine : BF12L513

1st version kW : 255.0 Rated speed : 1500

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

Opening

pressure, bar : 172...175

Test lines **: 1 680 750** 015

Outside diameter

x Wall thickness

x Length mm : 6.00x1.50x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Prestroke mm : 2.80...2.90

: (2.75...2.95)

Rack travel in mm : 9.00...12.00

Firing order : 1- 4- 9- 8- 5- 2-

A17

11- 10- 3- 6- 7- 12

: 0-15-60-75-120-135-180-195-240-255-300-Phasing

315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 700

Rack travel in mm : 11.00...11.10

Del.quantity cm3/: 12.5...12.7

100 s: (12.2...12.9)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 300.0Rack travel in mm: 6.6...6.8

Del.quantity cm3/ : 1.5...2.1

100 s: (1.2...2.3) Spread

cm3 : 0.4100 s: (0.7)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

: 125.0...127.0 Del.quantity

1000 : (122.5...129.5) Spread

: 4.00 cm3

1000 : (7.50)

RATED SPEED

1st version

Control Lever

position degrees: 86...94

Testina:

1st rack travel in: 10.00

Speed rpm : 750...755 2nd rack travel in: 5.50

rpm : 775...782 Speed

4th rack travel in: 820

Speed rpm : 0.00...1.00

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 10.00 Speed rpm : 750...755

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 140.0...160.0 1000 s: (136.0...164.0)

Remarks:

Check electrically unlatched starting fuel delivery (EES) with 24 volt.

On activation of the starting solenoid, the start position must be reached.

**APPLICATION** 

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet

Edition

Replaces

Test oil : ISO-4113

Combination no. : 0 401 840 755AC

Injection pump

Pump designation: PE12P110A920LS3173

EP type number : 0 411 810 708

Governor

Governor design. : RQV750PA823

: 0 421 813 573 Governer no.

Customer-spec, information Customer : KHD

Engine : BF12L513

1st version kW : 232.0 Rated speed : 1500

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

**Openina** 

pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter

x Wall thickness

x Length mm : 6.COX1.5GX600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_

BEGINNING OF DELIVERY

Prestroke mm

: 2.80...2.90 : (2.75...2.95)

Rack travel in mm : 9.00...12.00

: 1- 4- 9- 8- 5- 2-Firing order

: KHD : 31.08.92 Phasing

: 0-15-60-75-120-135-

180-195-240-255-300-

11- 10- 3- 6- 7- 12

315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rpm: 700 1st speed

Rack travel in mm : 11.00...11.10

Del.quantity cm3/: 12.5...12.7

100 s: (12.2...12.9)

Spread cm3 : 0.4

100 s: (0.7)

rpm : 300.02nd speed

Rack travel in mm : 6.6...6.8 Del.quantity cm3/ : 1.5...2.1

100 s: (1.2...2.3)

Spread cm3 : 0.4

100 s: (0.7)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Del.quantity : 125.0...127.0 1000 : (122.5...129.5)

: 4.00 Spread cm3

1000 : (7.50)

RATED SPEED

1st version

Testing:

1st rack travel in: 10.00

rpm : 750...755 Speed

2nd rack travel in: 5.50

Speed rpm : 775...782

4th rack travel in: 820

rpm : 0.00...1.00Speed

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 10.00

rpm : 750...755 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 140.0...160.0 1000 s: (136.0...164.0)

Remarks:

Check electrically unlatched starting fuel delivery (EES) with 24 volt.

:

On activation of the starting solenoid, the start position must be reached.

**APPLICATION** 

## BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : KHD

Edition : 31.08.92

Replaces : -

Test oil : ISO-4113

Combination no. : 0 401 840 755AD

Injection pump

Pump designation : PE12P110A920LS3173

EP type number : 0 411 810 708

Governor

Governor design, : RQV750PA823 Governer no. : 0 421 813 573

Customer-spec. information Customer : KHD

Engine : BF12L513

1st version kW : 228.0 Rated speed : 1500

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

Opening

pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter

x Wall thickness

x Length mm : 6.00x1.50x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Prestroke mm : 2.80...2.90

: (2.75...2.95)

Rack travel in mm : 9.00...12.00

Firing order : 1-4-9-8-5-2-

11-10-3-6-7-12

Phasing : 0-15-60-75-120-135-

180-195-240-255-300-

315

Tolerance  $+ - ^{\circ} : 0.50 (0.75)$ 

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 700

Rack travel in mm : 10.30...10.40

Del.quantity cm3/: 10.9...11.1

100 s: (10.6...11.3)

Spread cm3: 0.4

100 s: (0.7)

2nd speed rpm : 300.0

Rack travel in mm : 6.6...6.8 Del.quantity cm3/ : 1.5...2.1

100 s: (1.2...2.3)

Spread cm3: 0.4

100 s: (0.7)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm: 700

Del.quantity : 109.0...111.0

1000 : (106.5...113.5)

Spread cm3 : 4.00

1000 : (7.50)

RATED SPEED

1st version

Testing:

1st rack travel in: 9.30

Speed rpm : 750...755

2nd rack travel in: 5.50

Speed rpm : 773...780

4th rack travel in: 820

Speed rpm : 0.00...1.00

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 9.30

rom : 750...755 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 140.0...160.0 1000 s: (136.0...164.0)

Remarks:

Check electrically unlatched starting fuel delivery (EES) with 24 volt.

On activation of the starting solenoid, the start position must be reached.

**APPLICATION** 

: 0-15-60-75-120-135-180-195-240-255-300-

### Note remarks

Test sheet : KHD

Edition : 31.08.92

Replaces

Test oil : ISO-4113

Combination no. : 0 401 840 755AE

Injection pump

Pump designation : PE12P110A920LS3173

EP type number : 0 411 810 708

Governor

Governor design. : RQV750PA823 : 0 421 813 573 Governer no.

Customer-spec. information Customer : KHD

Engine : BF12L513

: 206.0 1st version kW Rated speed : 1500

TEST BENCH REQUIREMENTS

Test oil

inlet temp. \*C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter x Wall thickness

x Length mm

: 6.00x1.50x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Prestroke mm : 2.80...2.90

: (2.75...2.95) Rack travel in mm : 9.00...12.00

: 1- 4- 9- 8- 5- 2-Firing order

: 0.50 (0.75) Tolerance + - \*

Time to cyl. no. : 1

BASIC SETTING

Phasing

1st speed rpm: 700

Rack travel in mm : 10.30...10.40

Del.quantity cm3/: 10.9...11.1

100 s: (10.6...11.3)

315

Spread cm3 : 0.4

100 s: (0.7)

rpm : 300.02nd speed Rack travel in mm: 6.6...6.8

Del.quantity cm3/: 1.5...2.1

100 s: (1.2...2.3)

cm3 : 0.4Spread

100 s: (0.7)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 700 Speed

: 109.0...111.0 Del.quantity 1000 : (106.5...113.5)

: 4.00 Spread cm3

1000 : (7.50)

RATED SPEED

1st version

Testing:

1st rack travel in: 9.30

rpm : 750...755 Speed

2nd rack travel in: 5.50

rpm : 773...780 Speed

4th rack travel in: 820

rpm : 0.00...1.00Speed

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 9.30

Speed nom : 750...755

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 140.0...160.0 1000 s: (136.0...164.0)

Remarks:

Check electrically unlatched starting fuel delivery (EES) with 24 volt.

On activation of the starting solenoid, the start position must be reached.

APPLICATION

Test sheet : KHD

Edition : 21.09.92

Replaces

Test oil : ISO-4113

Combination no. : 0 401 840 763AA

Injection pump

Pump designation: PE12P11DA920LS3173

EP type number : 0 411 810 708

Governor

Governor design. : RQ300/1000PA803-1

Governer no. : 0 421 801 463

Customer-spec. information

Customer : KHD

Engine : BF12L5130

1st version kW : 342.0

: 2000 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

Opening

pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter

x Wall thickness

x Length mm : 6.00x1,50x600

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Prestroke mm : 2.80...2.90

: (2.75...2.95)

Rack travel in mm : 9.00...12.00

: 1- 4- 9- 8- 5- 2-Firing order

Phasing

: 0-15-60-75-120-135-

180-195-240-255-300-

315

Tolerance + - \* : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 900

Rack travel in mm : 12.00...12.10

Del.quantity cm3/: 14.9...15.1

1G0 s: (14.6...15.3)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 300.0

Rack travel in mm : 6.8...7.0

Del.quantity cm3/: 1.5...2.1

100 s: (1.2...2.3) Spread cm3 : 0.4

100 s: (0.7)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900

: 149.0...151.0 Del.quantity

1000 : (146.5...153.5)

Spread cm3 : 4.00

1000 : (7.50)

RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 11.00

rpm : 1035...1050 Speed

2nd rack travel in: 5.50

: 1070...1100 Speed rom

4th rack travel in: 1200

rpm : 0.00...1.00Speed

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 300 Rack travel in mm : 6.9

Testing:

Speed rpm : 100 Minimum rack trave: 8.40 Speed rpm : 300

Rack travel in mm : 6.80...7.00

Rack travel in mm : 2.00

rpm : 340...380 Speed

# BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.00

Speed rom : 1035...1050

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 135.0...165.0

1000 s: (131.0...169.0)

LOW IDLE

Speed rpm : 300 Rack travel in mm : 6.80...7.00 Del.quantity cm3/: 15.0...21.0 1000 s: (12.5...23.5)

cm3 : 4.50Spread

1000 s: (7.50)

Remarks:

APPLICATION

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : KHD

Edition

: 21.09.92

Replaces Test oil

: ISO-4113

Combination no.

: 0 401 840 763AB

Injection pump

Pump designation : PE12P110A920LS3173

EP type number

: 0 411 810 708

Governor

Governor design. : RQ300/1000PA803-1

Governer no.

: 0 421 801 463

Customer-spec. information : KHC Customer

Engine

: BF12L513C

1st version kW

: 311.0

Rated speed

: 2000

TEST BENCH REQUIREMENTS

Test oil

inlet temp. \*C

: 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly

: 0 681 343 009

Opening.

pressure, bar

: 172...175

Test Lines

: 1 680 750 015

Outside diameter

x Wall thickness

x Length mm

: 6.00x1.50x600

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values \_\_\_

BEGINNING OF DELIVERY

Prestroke mm

: 2.80...2.90

: (2.75...2.95)

Rack travel in mm : 9.00...12.00

Firing order

: 1- 4- 9- 8- 5- 2-

A27

11-10-3-6-7-12

Phasing

: 0-15-60-75-120-135-

180-195-240-255-300-

315

Tolerance + - °

: 0.50 (0.75)

Time to cyl. no.

BASIC SETTING

1st speed

rpm: 900

: 1

Rack travel in mm : 12.00...12.10

Del.quantity cm3/: 14.9...15.1

100 s: (14.6...15.3)

Spread

cm3 : 0.4

100 s: (0.7)

rpm : 300.0

2nd speed Rack travel in mm : 6.8...7.0

Del.quantity cm3/: 1.5...2.1

100 s: (1.2...2.3)

Spread

cm3 : 0.4

100 s: (0.7)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

Spread

Speed

rpm : 900

Del.quantity

: 149.0...151.0 1000 : (146.5...153.5)

: 4.00 cm3

1000 : (7.50)

RATED SPEED

1st version

Setting point: Speed

: 600 rpm

Rack travel in mm: 20.0

Testing:

Speed

1st rack travel in: 11.00

rpm : 1035...1050

2nd rack travel in: 5.50 Speed

rom

: 1070...1100

4th rack travel in: 1200 Speed rpm : 0.00...1.00LOW IDLE 1 Setting point w/out bumper spring Speed rpm : 300 Rack travel in mm : 6.9 Testing: Speed : 100 rpm Minimum rack trave: 8.40 Speed rpm : 300 Rack travel in mm : 6.80...7.00 Rack travel in mm: 2.00 Speed : 340...380 rom TORQUE CONTROL 2nd speed rpm : 650 BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 11.00 Speed rpm : 1035...1050 STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/: 135.0...165.0 1000 s: (131.0...169.0) LOW IDLE Speed rpm : 300 Rack travel in mm : 6.80...7.00 Del.quantity cm3/: 15.0...21.0 1000 s: (12.5...23.5) Spread cm3 : 4.501000 s: (7.50) Remarks: APPLICATION

BOSCH INU. PLMP TEST SPECIFICATIONS

Note remarks

Test sheet : KHD

Edition : 21.09.92

Replaces

: ISO-4113 Test oil

Combination no. : 0 401 840 763AC

Injection numb

Pump designation : PE12P110A920LS3173

EP type number : 0 411 810 708

Governor

Governor design. : RQ300/1000PA803-1

: 0 421 801 463 Governer no.

Customer-spec. information

Customer : KHD

Engine : BF12L513C

1st version kW : 272.0

Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

Opening 1

: 172...175 pressure, bar

Test lines : 1 680 750 015

Outside diameter

x Wall thickness

x Length mm : 6.00x1.50x600

(A) Injection pump setting values

Insp. values in parentheses

Set equal delivery quant.

per values \_

BEGINNING OF DELIVERY

Prestroke mm : 2.80...2.90

: (2.75...2.95)

Rack travel in mm : 9.00...12.00

Firing order : 1- 4- 9- 8- 5- 2-

**B01** 

11- 10- 3- 6- 7- 12

Phasing : 0-15-60-75-120-135-

180-195-240-255-300-

315

: 0.50 (0.75) Tolerance + - °

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 900

Rack travel in mm : 11.10...11.20

Del.quantity cm3/: 12.6...12.8

100 s: (12.3...13.0)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 300.0

Rack travel in mm: 6.8...7.0

Del.guantity cm3/ : 1.5 ... 2.1

100 s: (1.2...2.3)

Spread cm3 : 0.4

100 s: (0.7)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1 Speed rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900

: 126.0...128.0 Del.quantity

: (123.5. .130.5) 1000

: 4.00 cm3

1000 : (7.50)

RATED SPEED

Spread

1st version

Setting point:

Speed rpm

Rack travel in mm : 20.0

Testina:

1st rack travel in: 10.10

rpm : 1035...1050 Speed

2nd rack travel in: 5.50

Speed : 1060...1090 rpm

4th rack travel in: 1200

rpm : 0.00...1.00Speed

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 300 Rack travel in mm : 6.9

Testing:

Speed rpm : 100 Minimum rack trave: 8.40 Speed 70m : 300

Rack travel in mm : 6.80...7.00

Rack travel in mm: 2.00

rpm : 340...380 Speed

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 10.10

Speed rpm : 1035...1050

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 135.0...165.0 1000 s: (131.0...169.0)

LOW IDLE

Speed rpm : 300 Rack travel in mm : 6.80...7.00 Del.quantity cm3/: 15.0...21.0 1000 s: (12.5...23.5)

cm3 : 4.50 Spread

1000 s: (7.50)

Remarks:

**APPLICATION** 

BOSCH IN! PUMP TEST SPECIFICATIONS

11-10-3-6-7-12

Note remarks

Test sheet : KHD

: 21.09.92 Edition

Replaces

Test oil : ISO-4113

Combination no. : 0 401 840 763AD

Injection pump

Pump designation : PE12P110A920LS3173

EP type number : 0 411 810 708

Governor

Governor design. : RQ300/1000PA803-1

: 0 421 801 463 Governer no.

Customer-spec. information

Customer : KHD

Engine : BF12L513C

1st version kW : 263.0

Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

Openina

pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter

x Wall thickness

x Length mm : 6.00x1.50x600

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Prestroke mm : 2.80...2.90

: (2.75...2.95)

Rack travel in mm : 9.00...12.00

Firing order : 1- 4- 9- 8- 5- 2-

Phasing : 0-15-60-75-120-135-

180-195-240-255-300-

315

: 0.50 (0.75) Tolerance + - °

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 750

Rack travel in mm : 12.00...12.10

Del.quantity cm3/: 14.9...15.1

100 s: (14.6...15.3)

cm3 : 0.4Spread

100 s: (0.7)

2nd speed rpm : 300.0Rack travel in mm: 6.8...7.0

Del.quantity cm3/: 1.5...2.1

100 s: (1.2...2.3)

Spread cm3 : 0.4

100 s: (0.7)

GUIDE SLEEVE POSITION Control-Lever position

Degree: -1

Speed rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 750

Del.quantity : 149.0...151.0

1000 : (146.5...153.5)

: 4.00 Spread cm3

1000 : (7.50)

RATED SPEED

1st version

Setting point:

Speed : 600 rpm Rack travel in mm : 20.0

Testing:

1st rack travel in: 11.00

Speed rpm : 1035...1050

2nd rack travel in: 5.50

Speed : 1070...1100 rom

4th rack travel in: 1200

Speed rpm : 0.00...1.00

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 300 Rack travel in mm: 6.9

Testing:

Speed rpm : 100 Minimum rack trave: 8.40 Speed rpm : 300

Rack travel in mm : 6.80...7.00

Rack travel in mm : 2.00

Speed rpm : 340...380

### BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 11.00

Speed rpm : 1035...1050

STARTING FUEL DELIVERY

Speed : 100 rpm

Del.quantity cm3/: 135.0...165.0 1000 s: (131.0...169.0)

LOW IDLE

Speed rpm : 300

Rack travel in mm : 6.80...7.00 Del.quantity cm3/: 15.0...21.0

1000 s: (12.5...23.5)

cm3 : 4.50Spread

1000 s: (7.50)

Remarks:

APPLICATION

Test sheet : KHD

Edition : 21.09.92

Replaces

Test oil : ISO-4113

Combination no. : 0 401 840 763AE

injection pump

Pump designation : PE12P110A920LS3173

EP type number : 0 411 810 708

Governor

Governor design. : RQ300/1000PA803-1

: 0 421 801 463 Governer no.

Customer-spec. information

Customer : KHD

Engine : BF12L513

1st version kW : 232.0

: 2000 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

Test Lines : 1 680 750 015

Outside diameter

x Wall thickness

x Length mm : 6.00x1.50x600

(A) Injection pump setting values

Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Prestroke mm : 2.80...2.90

: (2.75...2.95)

Rack travel in mm : 9.00...12.00

Firing order : 1- 4- 9- 8- 5- 2-

Phasing : 0-15-60-75-120-135-

180-195-240-255-300-

315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 750

Rack travel in mm : 11.00...11.10

Del.quantity cm3/: 12.5...12.7

100 s: (12.2...12.9)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 300.0

Rack travel in mm: 6.8...7.0 Del.quaratity cm3/: 1.5...2.1

100 s: (1.2...2.3)

cm3 : 0.4Spread

100 s: (0.7)

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

Speed rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 750

: 125.0...127.0 Del.quantity

1000 : (122.5...129.5)

: 4.00 Spread cm3

1000 : (7.50)

RATED SPEED

1st version

Setting point:

: 600 Speed rpm

Rack travel in mm: 20.0

Testing:

1st rack travel in: 10.00

rpm : 1040...1050 Speed

2nd rack travel in: 5.50

: 1065...1095 Speed rom

4th rack travel in: 1200 rpm : 0.00...1.00Speed LOW IDLE 1 Setting point w/out bumper spring rpm : 300 Rack travel in mm: 6.9 Testing: rpm : 100 Speed Minimum rack trave: 8.40 Speed rpm : 300 Rack travel in mm : 6.80...7.00 Rack travel in mm: 2.00 Speed rpm : 340...380 TCRQUE CONTROL Dimension a mm : 0.20 Torque control curve - 1st version 1st speed rpm : 750 Rack travel in m: 11.00...11.10 2nd speed rpm : 650 Rack travel in m: 11.30...11.50 **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 10.00 rpm : 1040...1050 Speed STARTING FUEL DELIVERY rpm : 100 Speed Del.quantity cm3/: 135.0...165.0 1000 s: (131.0...169.0) LOW IDLE rpm Speed : 300 Rack travel in mm : 6.80...7.00 Del.quantity cm3/: 15.0...21.0 1000 s: (12.5...23.5) Spread cm3 : 4.501000 s: (7.50) Remarks: **APPLICATION** 

Test sheet : KHD

Edition : 21.09.92

Replaces

Test oil : ISO-4113

Combination no. : 0 401 840 763AF

Injection pump

Pump designation : PE12P110A920LS3173

EP type number : 0 411 810 708

Governor

Governor design. : RQ300/1000PA803-1

Governier no. : 0 421 801 465

Customer-spec. information

Customer : KHD

: BF12L513 Engine

1st version kW : 220.0

Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

**Opening** 

pressure, bar : 172...175

Test Lines : 1 680 750 015

Outside diameter

x Wall thickness

x Length mm : 6.00x1.50x600

(A) Injection pump setting values

Insp. values in parentheses

Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Prestroke mm : 2.80...2.90

: (2.75...2.95)

Rack travel in mm : 9.00...12.00

: 1- 4- 9- 8- 5- 2-Firing order

807

Phasing : 0-15-60-75-120-135-

180-195-240-255-300-

315

: 0.50 (0.75) Tolerance + - °

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 750

Rack travel in mm : 10.60...10.70

Del.quantity cm3/: 11.6...11.8

100 s: (11.3...12.0)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 300.0

Rack travel in mm: 6.8...7.0

Del.quantity cm3/ : 1.5...2.1 100 s: (1.2...2.3)

Spread cm3 : 0.4

100 s: (0.7)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1 rpm : 600

Speed Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 750

Del.quantity : 116.0...118.0

1000 : (113.5...120.5)

Spread cm3 : 4.00

1000 : (7.50)

RATED SPEED

1st version

Setting point:

Speed

rpm

Rack travel in mm : 20.0

Testing:

1st rack travel in: 9.60

rpm : 1040...1050

Speed 2nd rack travel in: 5.50

Speed rpm : 1060...1090 4th rack travel in: 1200

rom : 0.00...1.00Speed

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 300 Rack travel in mm : 6.9

Testing:

Speed : 100 rpm Minimum rack trave: 8.40 Speed : 300 **PDIA** 

Rack travel in mm : 6.80...7.00

Rack travel in mm : 2.00 Speed rom : 340...380

TORQUE CONTROL

Dimension a mm : 0.20

Torque control curve - 1st version

rpm : 750 1st speed

Rack travel in m: 10.60...10.70

rpm : 650 2nd speed

Rack travel in m: 10.90...11.10

## BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 9.60

rpm : 1040...1050 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 135.0...165.0 1000 s: (131.0...169.0)

LOW IDLE

Speed rpm : 300 Rack travel in mm : 6.80...7.00 Del.quantity cm3/: 15.0...21.0 1000 s: (12.5...23.5)

Spread cm3 : 4.50

1000 s: (7.50)

Remarks:

### APPLICATION

BOSCH INJ. PUMP TEST SPECIFICATIONS

11- 10- 3- 6- 7- 12

Note remarks

Test sheet : KHD

Edition : 21.09.92

Replaces

Test oil : ISO-4113

Combination no. : 0 401 840 763AG

Injection pump

Pump designation : PE12P110A920LS3173

EP type number : 0 411 810 708

Governor

Governor design: RQ300/1000PA803-1

: 0 421 801 463 Governer no.

Customer-spec. information

Customer : KHD

Engine : 3F12L513

1st version kW : 215.0

Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

**Openina** 

pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter

x Wall thickness

x Length mm : 6.00x1.50x600

(A) Injection pump setting values

Insp. values in parentheses

Set equal delivery quant.

BEGINNING OF DELIVERY

Prestroke mm : 2.80...2.90

: (2.75...2.95)

Rack travel in mm : 9.00...12.00

Firing order : 1- 4- 9- 8- 5- 2-

per values

Phasing : 0-15-60-75-120-135-180-195-240-255-300-

315 Tolerance + - • : 0.50 (0.75)

BASIC SETTING

1st speed rpm: 750

Time to cyl. no. : 1

Rack travel in mm : 10.50...10.60

Del.quantity cm3/: 11.4...11.6

100 s: (11.1...11.8)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 300.0

Rack travel in mm: 6.8...7.0 Del.quantity cm3/: 1.5...2.1

100 s: (1.2...2.3)

Spread cm3 : 0.4

100 s: (0.7)

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 600 Speed

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 750

Del.quantity : 114.0...116.0

1000 : (111.5...118.5)

: 4.00 Spread cm3

1000 : (7.50)

RATED SPEED

1st version

Setting point:

Speed rpm

Rack travel in mm: 20.0

Testing:

1st rack travel in: 9.50

Speed rpm : 1040...1050

2nd rack travel in: 5.50

Speed : 1060...1090 rom

4th rack travel in: 1200 Speed rpm : 0.00...1.00LOW IDLE 1 Setting point w/out bumper spring rpm : 300 Rack travel in mm: 6.9 Testing: Speed : 100 rpm Minimum rack trave: 8.40 mpm : 300 3peed Rack travel in mm: 6.80...7.00
Rack travel in mm: 2.00
Speed rpm: 340...380 TORQUE CONTROL Dimension a mm : 0.20 Torque control curve - 1st version rpm : 750 1st speed Rack travel in m: 10.50...10.60 2nd speed rpm : 650 Rack travel in m: 10.80...11.00 **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 9.50 Speed rpm : 1040...1050 STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/ : 135.0...165.0 1000 s: (131.0...169.0) LOW IDLE Speed : 300 rpm Rack travel in mm : 6.80...7.00 Del.quantity cm3/: 15.0...21.0 1000 s: (12.5...23.5) cm3 : 4.50Spread 1000 s: (7.50) Remarks: **APPLICATION** 

Generator set

BOSCH INJ. PUMP TEST SPECIFICATIONS

11- 10- 3- 6- 7- 12

: 0-15-60-75-120-135-

180-195-240-255-300-

Note remarks

Test sheet : KHD

: 21.09.92 Edition

Replaces

Test oil : ISO-4113

Combination no. : O 401 840 763AH

Injection pump

Pump designation: PE12P110A920LS3173

EP type number : 0 411 810 708

Governor

Governor design. : RQ300/1000PA803-1

: 0 421 801 463 Governer no.

Customer-spec. information

Customer : KHD

Engine : BF12L513

1st version kW : 206.0

Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil

inlet temp. "C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening

: 172...175 pressure, bar

Test Lines : 1 680 750 015

Outside diameter

x Wall thickness

x Length mm : 6.00x1.50x600

(A) Injection pump setting values

Insp. values in parentheses

Set equal delivery quant.

per values \_

BEGINNING OF DELIVERY

: 2.80...2.90 Prestroke mm

: (2.75...2.95)

Rack travel in mm : 9.00...12.00

: 1- 4- 9- 8- 5- 2-Firing order

: 0.50 (0.75) Tolerance + - \*

Time to cyl. no. : 1

BASIC SETTING

Phasing

1st speed rom: 750

Rack travel in mm : 10.30...10.40

Del.quantity cm3/: 10.9...11.1

100 s: (10.6...11.3)

315

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 300.0Rack travel in mm : 6.8...7.0 Del.quantity cm3/: 1.5...2.1

100 s: (1.2...2.3)

Spread cm3 : 0.4100 s: (0.7)

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

Speed rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed **LDW** 

: 109.0...111.0 Del.quantity 1000 : (106.5...113.5)

Spread cm3 : 4.00

> 1000 : (7.50)

RATED SPEED

1st version

Setting point:

Speed rpm Rack travel in mm : 20.0

Testing:

1st rack travel in: 9.30

rpm : 1040...1050 Speed

2nd rack travel in: 5.50

Speed : 1055...1085 rpm

4th rack travel in: 1200

Speed rpm : 0.00...1.00

LOW IDLE 1

Setting point w/out bumper spring

rpm : 300 Rack travel in mm : 6.9

Testing:

rpm : 100 Speed Minimum rack trave: 8.40 rpm : 300 Speec!

Rack travel in mm : 6.80...7.00
Rack travel in mm : 2.00 Speed rpm : 340...380

TURBUE CONTROL

Dimension a mm : 0.20

Torque control curve - 1st version

1st speed rpm : 750

Rack travel in m: 10.30...10.40

2nd speed rpm : 650

Rack travel in m: 10.60...10.80

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 9.30

Speed rpm : 1040...1050

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 135.0...165.0 1000 s: (131.0...169.0)

LOW IDLE

Speed rpm : 300
Rack travel in mm : 6.80...7.00
Del.quantity cm3/ : 15.0...21.0 1000 s: (12.5...23.5)

Spread cm3 : 4.501000 s: (7.50)

Remarks:

APPLICATION

Generator set

: 0-15-60-75-120-135-

180-195-240-255-300-

## Note remarks

Test sheet : KHD

Edition : 31.08.92

Replaces

Test oil : ISO-4113

Combination no. : 0 401 840 764AA

Injection pump

Pump designation : PE12P110A920LS3173

: 0 411 810 708 EP type number

Governor

: RQV300...1150PA820-1 Governor design.

Governer no. : 0 421 813 727

Customer-spec, information

Customer : KHD

Engine : EF12L513

1st version kW : 334.0 Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

**Opening** 

pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter

x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values

Insp. values in parentheses Set equal delivery quant.

per values \_\_\_

BEGINNING OF DELIVERY

: 2.80...2.90 Prestroke mm

: (2.75...2.95)

Rack travel in mm : 9.00...12.00

Firing order : 1- 4- 9- 8- 5- 2Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

Phasing

rpm: 1150 1st speed

Rack travel in mm : 11.30...11.40

Del.quantity cm3/: 13.0...13.2

100 s: (12.7...13.4)

Spread cm3 : 0.4

100 s: (0.7)

rpm : 300.0 2nd speed Rack travel in mm: 6.6...6.8 Del.quantity cm3/: 1.4...2.0

100 s: (1.1...2.2)

cm3 : 0.4Spread

100 s: (0.7)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

rpm : 300 1st speed

: 1.10...1.40 travel mm

rpm : 450 2nd speed

2.80...3.20 travel mm

rpm : 750 3rd speed

: 4.90...5.30 travel mm

rpm : 1200 4th speed

travel mm : 8.40...8.60

rpm : 13005th speed

: 9.40...9.80 travel mm

GUIDE SLEEVE POSITION

Control-lever position Degree: -1

rpm : 1190 Speed

Rack travel in mm: 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

Aneroid pressure h: 980

Del.quantity : 130.0...132.0

1000 : (127.5...134.5)

Spread cm3

: 4.00 1000 : (7.50)

RATED SPEED

1st version

Control lever

position degrees: 119...127

Testing:

1st rack travel in: 10.30

Speed rpm : 1190...1200 2nd rack travel in: 5.50

rpm : 1260...1290 Speed

4th rack travel in: 1400

Speed man : 0.00...1.00

LOW IDLE 1

Control lever

position degrees: 85...93

Testing:

Speed : 100 man

Minimum rack trave: 8.20 rpm : 300

Rack travel in mm : 6.60...6.80

CONSTANT REGULATION

rpm : 300...510 Speed

TORQUE CONTROL

Dimension a mm : -

Torque control curve - 1st version

1st speed

st speed rpm : 1150
Rack travel in m: 11.30...11.40

2nd speed rpm : 650

Rack travel in m: 11.30...11.50

Aneroid/Altitude Compensator Test

1st version Setting

: 450 Speed nom: Pressure hPa : 980

Rack travel mm : 11.30...11.40

Measurement

1/min: 450 Speed

1st pressure hPa : -

Rack travel in m: 10.40...10.60

2nd pressure hPa : 480

Rack travel in m: 11.10...11.20 3rd pressure hPa : 425

Rack travel in m: 10.60...10.80

START CUT-OUT

Speed 1/min: 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

Speed rpm : 450 Del.quantity cm3/ : 108.0...112.0

1000 s: (105.5...114.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.30

rpm : 1190...1200 Speed

STARTING FUEL DELIVERY

Speed rom : 100

Del.quantity cm3/: 140.0...160.0

1000 s: (136.0...164.0)

Remarks:

Check electrically unlatched starting fuel delivery (EES) with 24 volt.

: 0-15-60-75-120-135-

## Note remarks

Test sheet : KHD

Edition : 31.08.92

Replaces

Test oil : ISO-4113

Combination no. : 0 401 840 764AB

Injection pump

Pump designation : PE12P110A920LS3173

EP type number : 0 411 810 708

Governor

Governor design. : RQV300...1150PA820-1

Governer no. : 0 421 813 727

Customer-spec. information

Customer : KHD

Engine : BF12L513

1st version kW : 323.0 : 2300 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter

x Wall thickness

x Length mm : 6.00x1.50x600

(A) Injection pump setting values

Insp. values in parentheses

Set equal delivery quant.

per values

BEGINNING OF DELIVERY

: 2.80...2.90 Prestroke mm

: (2.75...2.95)
Rack travel in mm : 9.00...12.00

: 1- 4- 9- 8- 5- 2firing order

180-195-240-255-300-315

: 0.50 (0.75) Tolerance + - •

Time to cyl. no. : 1

BASIC SETTING

Phasing

1st speed rpm: 1150

Rack travel in mm : 11.10...11.20

Del.quantity cm3/: 12.5...12.7

100 s: (12.2...12.9)

Spread cm3 : 0.4

100 s: (0.7)

rpm : 300.02nd speed

Rack travel in mm: 6.6...6.8 Del.quantity cm3/: 1.4...2.0

100 s: (1.1...2.2)

Spread cm3 : 0.4100 s: (0.7)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300

: 1.10...1.40 travel nm

2nd speed rpm : 450

travel mm : 2.80...3.20

3rd speed rpm : 750

travel mm : 4.90...5.30

4th speed rpm : 1200

travel mm : 8.40...8.60

5th speed rpm : 1300

travel mm : 9.40...9.80

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1190 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

Aneroid pressure h: 950

Del.quantity : 125.0...127.0

1000 : (122.5...129.5)

: 4.00 Spread cm3

1000 : (7.50)

RATED SPEED

1st version Control lever

position degrees: 119...127

Testing:

1st rack travel in: 10.10

rpm : 1190...1200 Speed

2nd rack travel in: 5.50

rpm : 1260...1290 Speed

4th rack travel in: 1400

mom : 0.00...1.00Speed

LOW IDLE 1

Control lever

position degrees: 85...93

Testina:

Speed man : 100 Minimum rack trave: 8.20 rpm : 300 Speed

Rack travel in mm : 6.60...6.80

CONSTANT REGULATION

rpm : 300...510 Speed

TORQUE CONTROL

Dimension a mm

Torque control curve - 1st version

1st speed rpm : 1150

Rack travel in m: 11.10...11.20

2nd speed rpm : 650

Rack travel in m: 11.10...11.30

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed man : 450 hPa : 950 Pressure

: 11.10...11.20 Rack travel mm

Measurement

1/min: 450 Speed

1st pressure hPa : -

Rack travel in m: 10.40...10.60

2nd pressure hPa : 455

Rack travel in m: 10.90...11.00

3rd pressure hPa : 410

Rack travel in m: 10.50...10.70

START CUT-OUT

1/min: 220 (240) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

rpm : 450 Speed

Del.quantity cm3/: 108.0...112.0

1000 s: (105.5...114.5)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 10.10

Speed rpm : 1190...1200

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 140.0...160.0 1000 s: (136.0...164.0)

Remarks:

Check electrically unlatched starting fuel delivery (EES) with 24 volt.

Test sheet : KHD

Edition : 31.08.92

Replaces

Test oil : ISO-4113

Combination no. : 0 401 840 764AC

Injection pump

Pump designation : PE12P110A920LS3173

: 0 411 810 708 EP type number

Governor

Governor design. : RQV300...1150PA820-1

: 0 421 813 727 Governer no.

Customer-spec. information

Customer : KHD

Engine : BF12L513

1st version kW : 316.0 Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Openina

pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter

x Wall thickness

: 6.00x1,50x600 x Length mm

(A) Injection pump setting values

Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Prestroke mm : 2.80...2.90

: (2.75...2.95)

Rack travel in mm : 9.00...12.00

Firing order : 1- 4- 9- 8- 5- 2-

: 0-15-60-75-120-135-

180-195-240-255-300-

315

: 0.50 (0.75) Tolerance + - °

Time to cyl. no. : 1

BASIC SETTING

Phasing

1st speed rpm: 1150

Rack travel in mm : 10.90...11.00

Del.quantity cm3/: 12.2...12.4

100 s: (11.9...12.6)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 300.0

Rack travel in mm: 6.6...6.8

Del.quantity cm3/: 1.4...2.0 100 s: (1.1...2.2)

cm3 : 0.4Spread

100 s: (0.7)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 1.10...1.40 2nd speed

rpm : 450

: 2.80...3.20 rpm : 750 travel mm 3rd speed

travel mm : 4.90...5.30

4th speed rpm : 1200

travel mm : 8.40...8.60

rpm : 1300 5th speed

travel mm : 9.40...9.80

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1190 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

Aneroid pressure h: 900 : 122.0...124.0 Del.quantity

1000 : (119.5...126.5)

Spread : 4.00 cm31000 : (7.50)

RATED SPEED

1st version Control lever

position degrees: 119...127

Testing:

1st rack travel in: 9.90

rpm : 1190...1200 Speed

2nd rack travel in: 5.50

rpm : 1260...1290 Speed

4th rack travel in: 1400

Speed  $rp_0 : 0.00...1.03$ 

LOW IDLE 1 Control lever

position degrees: 85...93

Testing:

Speed : 100 rpm Minimum rack trave: 8.20 rpm : 300 Speed

Rack travel in mm : 6.60...6.80

CONSTANT REGULATION

rpm : 300...510Speed

TORQUE CONTROL

Dimension a mm

Torque control curve - 1st version

1st speed rpm : 1150

Rack travel in m: 10.90...11.00

2nd speed rpm : 650

Rack travel in m: 10.90...11.10

Aneroid/Altitude Compensator Test

1st version

Setting

Speed : 450 MCC Pressure hPa : 900

: 10.90...11.00 Rack travel mm

Measurement

1/min: 450 Speed

1st pressure hPa : -

Rack travel in m: 10.40...10.60

2nd pressure hPa : 440

Rack travel in m: 10.80...10.90

3rd pressure hPa : 410

Rack travel in m: 10.50...10.70

START CUT-OUT

1/min : 220 (240) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

Speed rpm : 450

Del.quantity cm3/: 108.0...112.0

1000 s; (105.5...114.5)

BREAKAWAY

1st version

imm rack travel less than

full load rack tr: 9.90

rpm : 1190...1200 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 140.0...160.0

1000 s: (136.0...164.0)

Remarks:

Check electrically unlatched starting fuel delivery (EES) with 24 volt.

Test sheet : KHD

Edition : 31.08.92

Replaces

Test oil : ISO-4113

Combination no. : 0 401 840 764AD

Injection pump

Pump designation : PE12P110A920LS3173

: 0 411 810 708 EP type number

Governor

Governor design. : RQV300...1150PA820-1

Governer no. : 0 421 813 727

Customer-spec. information

Customer : KHD

Engine : BF12L513

1st version kW : 302.0

Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

Test Lines : 1 680 750 015

Outside diameter

x Wall thickness

x Length mm : 6.00x1.50x600

(A) Injection pump setting values

Insp. values in parentheses

Set equal delivery quant.

per values \_\_\_

BEGINNING OF DELIVERY

Prestroke mm : 2.80...2.90

: (2.75...2.95)

Rack travel in mm : 9.00...12.00

Firing order : 1- 4- 9- 8- 5- 2-

B19

Phasina

: 0-15-60-75-120-135-

180-195-240-255-300-

315

: 0.50 (0.75) Tolerance + - °

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 10.50...10.60

Del.quantity cm3/: 11.7...11.9

100 s: (11.4...12.1)

Spread cm3 : 0.4

100 s: (0.7)

rpm : 300.0 2nd speed

Rack travel in mm : 6.6...6.8

Del.quantity cm3/: 1.4...2.0

100 s: (1.1...2.2)

Spread cm3 : 0.4100 s: (0.7)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

ist speed rpm : 300

: 1.10...1.40 travel mm

2nd speed rom : 450

travel mm : 2.80...3.20

3rd speed rpm : 750

travel mm : 4.90...5.30

4th speed : 1200 rom

: 8.40...8.60 travel mm

5th speed rpm : 1300

: 9.40...9.80 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1190 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

rpm : 1150

Del.quantity : 117.0...119.0

1000 : (114.5...121.5)

Spread cm3 : 4.00

1000 : (7.50)

## RATED SPEED

1st version Control lever

position degrees: 119...127

Testina:

1st rack travel in: 9.50

rpm : 1190...1200 Speed

2nd rack travel in: 5.50

Speed rpm : 1255...1285

4th rack travel in: 1400

Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever

position degrees: 85...93

Testing:

Speed mom : 100 Minimum rack trave: 8.20

rpm : 300 Speed

Rack travel in mm : 6.60...6.30

CONSTANT REGULATION

rpm : 300...510 Speed

TORQUE CONTROL

Dimension a mm

Torque control curve - 1st version

1st speed rpm : 1150

Rack travel in m: 10.50...10.60

2nd speed rpm : 650

Rack travel in m: 10.50...10.70

START CUT-OUT

1/min: 220 (240) Speed

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 9.50

Speed rpm : 1190...1200

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 140.0...160.0 1000 s: (136.0...164.0)

Remarks:

Test sheet : KHD

: 31.08.92 Edition

Replaces

Test oil : ISO-4113

Combination no. : 0 401 840 764AE

Injection pump

Pump designation : PE12P110A920LS3173

: 0 411 810 708 EP type number

Governor

Governor design. : RQV300...1150PA820-1

Governer no. : 0 421 813 727

Customer-spec. information Customer : KHD

Engine : BF12L513

: 290.0 1st version kW : 2300 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

Openina

pressure, bar : 172...175

Test Lines : 1 680 750 015

Outside diameter

x Wall thickness

x Length mm : 6.00x1.50x600

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant. per values

BEGINNING OF DELIVERY

: 2.80...2.90 Prestroke mm

: (2.75...2.95)

Rack travel in mm : 9.00...12.00

Firing order : 1- 4- 9- 8- 5- 2: 0-15-60-75-120-135-180-195-240-255-300-315

: 0.50 (0.75) Tolerance + - \*

Time to cyl. no. : 1

BASIC SETTING

Phasing

1st speed rpm: 1150

Rack travel in mm: 10.20...10.30

Del.guantity cm3/: 11.0...11.2

100 s: (10.7...11.4)

cm3 : 0.4Spread

100 s: (0.7)

rpm : 300.02nd speed Rack travel in mm: 6.6...6.8 Del.quantity cm3/: 1.4...2.0 100 s: (1.1...2.2)

Spread cm3 : 0.4

100 s: (0.7)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300

: 1.10...1.40 travel mm

rpm : 450 2nd speed

: 2.80...3.20 travel mm

3rd speed rpm : 750 travel mm

: 4.90...5.30

rom : 1200 4th speed

: 8.40...8.60 travel mm

: 1300 5th speed mar

: 9.40...9.80 travel mm

GUIDE SLEEVE FOSITION Control-lever position

Degree: -1

rpm : 1190 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

Del.quantity : 110.0...112.0

1000 : (107.5...114.5)

Spread

cm3 : 4.00

1000 : (7.50)

## RATED SPEED

1st version

Control lever

position degrees: 119...127

Testing:

1st rack travel in: 9.20

Speed rpm : 1190...1200

2nd rack travel in: 5.50

Speed rpm : 1250...1280

4th rack travel in: 1400

Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever

position degrees: 85...93

Testina:

Speed rpm: 100

Minimum rack trave: 8.20

Speed rpm: 300

Rack travel in mm : 6.60...6.80

CONSTANT REGULATION

Speed rpm : 300...510

TORQUE CONTROL

Dimension a mm : -

Torque control curve - 1st version

1st speed rpm : 1150

Rack travel in m: 10.20...10.30

2nd speed rpm : 650

Rack travel in m: 10.20...10.40

START CUT-OUT

Speed 1/min: 220 (240)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 9.20

Speed rpm : 1190...1200

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 140.0...160.0

1000 s: (136.0...164.0)

Remarks:

:

On activation of the starting solenoid, the start position must be reached.

**B22** 

Test sheet : KHD

Edition : 31.08.92

Replaces

Test oil : ISO-4113

Combination no. : 0 401 840 764AF

Injection pump

Pump designation : PE12P110A920LS3173

EP type number : 0 411 810 708

Sovernor

Governor design. : RQV300...1150PA820-1

Governer no. : 0 421 813 727

Customer-spec. information Customer : KHD

Engine : BF12L513

1st version kW : 278.0 Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening 1

pressure, bar : 172...175

Test Lines : 1 680 750 015

Outside diameter

x Wall thickness

x Length mm : 6.00x1.50x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Prestroke mm : 2.80...2.90

: (2.75...2.95)

Rack travel in mm : 9.00...12.00

Firing order : 1- 4- 9- 8- 5- 2Phasing : 0-15-60-75-120-135-

180-195-240-255-300-

315

Tolerance + - \* : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1150

Rack travel in mm : 9.80...9.90

Del.quantity cm3/: 10.4...10.6

100 s: (10.1...10.8)

Spread cm3 : 0.4

100 s: (0.7)

rpm : 300.0 2nd speed

Rack travel in mm : 6.6...6.8 Del.quantity cm3/: 1.4...2.0

100 s: (1.1...2.2)

Spread cm3 : 0.4

100 s: (0.7)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300

: 1.10...1.40 travel mm

2nd speed rpm : 450

: 2.80...3.20 travel mm

3rd speed rpm : 750

: 4.90...5.30 travel mm

4th speed : 1200 rpm

: 8.40...8.60 travel mm

rpm : 1300 5th speed

travel mm : 9.40...9.80

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1190 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

Del.quantity : 104.0...106.0

1000 : (101.5...108.5)

Spread

cm3 : 4.00

1000 : (7.50)

RATED SPEED

1st version

Control lever

position degrees: 119...127

Testira:

1st rack travel in: 8.80

Speed rpm : 1190...1200 2nd rack travel in: 5.50 Speed rpm : 1245...1275

4th rack travel in: 1400

rpm : 0.00...1.00 Speed

LOW IDLE 1

Control lever

position degrees: 85...93

Testina:

Speed rom : 100

Minimum rack trave: 8.20

Speed rpm : 300

Rack travel in mm : 6.60...5.30

CONSTANT REGULATION

rpm : 300...510 Speed

TORQUE CONTROL.

Dimension a mm

Torque control curve - 1st version

rpm : 1150 1st speed

Rack travel in m: 9.80...9.90

rpm : 650 2nd speed

Rack travel in m: 9.80...10.00

START CUT-OUT

1/min: 220 (240) Speed

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 8.80

Speed rpm : 1190...1200

STARTING FUEL DELIVERY

Speed : 100 mch.

Del.quantity cm3/: 140.0...160.0

1000 s: (136.0...164.0)

Remarks:

Test sheet : KHD

Edition : 31.08.92

Replaces

Test oil : ISO-4113

Combination no. : 0 401 840 764AG

Injection pump

Pump designation : PE12P110A920LS3173

EP type number : 0 411 810 708

Sovernor

Governor design. : RQV300...1150PA820-1

: 0 421 813 727 Governer no.

Customer-spec. information Customer

: KHD

Engine : BF12L513

1st version kW : 250.0 Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

**Opening** 

pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter

x Wall thickness

x Length mm : 6.00x1.50x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_

BEGINNING OF DELIVERY

Prestroke mm : 2.80...2.90

: (2.75...2.95)

Rack travel in mm : 9.00...12.00

Firing order : 1- 4- 9- 8- 5- 2-

**B25** 

: 0-15-60-75-120-135-180-195-240-255-300-Phasing

315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1150

Rack travel in mm : 9.40...9.50

Del.quantity cm3/: 9.4...9.6

100 s: (9.1...9.8)

Spread cm3 : 0.4

100 s: (0.7)

rpm : 300.0 2rid speed

Rack travel in mm: 6.6...6.8 Del.quantity cm3/: 1.4...2.0

100 s: (1.1...2.2)

Spread cm3 : 0.4100 s: (0.7)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 1.10...1.40

2nd speed rpm : 450

travel mm : 2.80...3.20 3rd speed

rpm : 750 travel mm

: 4.90...5.30

4th speed rpm : 1200

travel mm : 8.40...8.60

: 1300 5th speed rpm

travel mm : 9.40...9.80

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1190 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

Del.quantity : 94.0...96.0

1000 : (91.5...98.5)

cm3 : 4.00Spread 1000 : (7.50)

RATED SPEED

1st version Control lever

position degrees: 119...127

Testing:

1st rack travel in: 8.40

Speed rpm : 1190...1200 2nd rack travel in: 5.50

rpm : 1240...1270 Speed

4th rack travel in: 1400

Speed rpm : 0.00...1.00

LOW IDLE 1 Control lever

position degrees: 85...93

Testing:

Speed rpm : 100 Minimum rack trave: 8.20 nom : 300

Rack travel in mm : 6.60...6.80

CONSTANT REGULATION

rpm : 300...510 Speed

TORQUE CONTROL

Dimension a mm

Torque control curve - 1st version

rpm : 1150 1st speed

Rack travel in m: 9.40...9.50

2nd speed rpm : 650

Rack travel in m: 9.40...9.60

START CUT-OUT

1/min: 220 (240) Speed

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 8.40

rpm : 1190...1200 Speed

STARTING FUEL DELIVERY

Speed : 100 rpm

Del.quantity cm3/: 140.0...160.0

1000 s: (136.0...164.0)

Remarks:

On activation of the starting solenoid, the start position must be reached.

**B26** 

BOSCH INJ. PUMP TEST SPECIFICATIONS

11- 10- 3- 6- 7- 12

Note remarks

Test sheet : KHD

Edition : 31.08.92

Replaces

Test oil : ISO-4113

Combination no. : 0 401 840 764AH

Injection pump

Pump designation : PE12P110A920LS3173

: 0 411 810 708 EP type number

Governor

Governor design. : RQV300...1150PA820-1

: 0 421 813 727 Governer no.

Customer-spec. information

: KHD Customer

Engine : @F12L513

1st version kW : 307.0

: 2300 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening

: 172...175 pressure, bar

: 1 680 750 015 Test lines

Outside diameter

x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Prestroke mm : 2.80...2.90

: (2.75...2.95)

Rack travel in mm : 9.00...12.00

Firing order : 1- 4- 9- 8- 5- 2Phasina : 0-15-60-75-120-135-

180-195-240-255-300-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 10.60...10.70

Del.quantity cm3/: 11.9...12.1

100 s: (11.6...12.3)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 300.0

Rack travel in mm : 6.6...6.8

Del.quantity cm3/: 1.4...2.0 100 s: (1.1...2.2)

cm3 : 0.4Spread

100 s: (0.7)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

3rd speed

rpm : 300 1st speed

travel mm : 1.10...1.40

rpm : 450 2nd speed

travel mm : 2.80...3.20 rpm : 750

travel mm : 4.90...5.30

4th speed rpm : 1200

travel mm : 8.40...8.60 5th speed rpm : 1300

travel mm : 9.40...9.80

GUIDE SLEEVE POSITION Control-Lever position

Degree: -1

rpm : 1190 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

: 119.0...121.0 Del.quantity

1000 : (116.5...123.5)

Spread

cm3 : 4.00

1000 : (7.50)

RATED SPEED

1st version

Control lever

position degrees: 119...127

Testina:

1st rack travel in: 9.60

Speed rpm : 1190...1200

2nd rack travel in: 5.50

rpm : 1155...1185 Speed

4th rack travel in: 1400

Speed npm : 0.00...1.00

LOW IDLE 1

Control lever

position degrees: 85...93

Testing:

Speed rpm : 100

Minimum rack trave: 8.20

rpm : 300 Speed

Rack travel in mm : 6.60...6.80

CONSTANT REGULATION

Speed rpm : 300...510

TORQUE CONTROL

Dimension a mm

Torque control curve - 1st version

1st speed rpm : 1150

Rack travel in m: 10.60...10.70

2nd speed rpm : 650 Rack travel in m: 10.60...10.80

START CUT-OUT

Speed 1/min: 220 (240)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.60

Speed nom : 1190...1200

STARTING FUEL DELIVERY

Speed : 100 LDUI

Del.quantity cm3/: 140.0...160.0 1000 s: (136.0...164.0)

Remarks:

On activation of the starting solenoid, the start position must be reached.

**B28** 

Test sheet : KHD

Edition : 21.09.92

Replaces

Test oil : ISO-4113

Combination no. : 0 401 840 765AA

Injection pump

Pump designation : PE12P110A920LS3173

: 0 411 810 708 EP type number

Governor

Governor design. : RQV300...1000PA907

Governer no. : 0 421 813 729

Customer-spec. information Customer : KHD

Engine : BF12L5130

1st version kW : 333.0

Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

Opening

pressure, bar : 172...175

Test Lines : 1 680 750 015

Outside diameter

x Wall thickness

x Length mm : 6.00X1.50X600

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values \_\_\_

BEGINNING OF DELIVERY

Prestroke mm : 2.80...2.90

: (2.75...2.95)

Rack travel in mm : 9.00...12.00

Firing order : 1- 4- 9- 8- 5- 2Phasing

: 0-15-60-75-120-135-

180-195-240-255-300-

315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1000

Rack travel in mm : 11,40...11.50

Del.quantity cm3/: 13.3...13.5

100 s: (13.0...13.7)

Spread cm3 : 0.4

100 s: (0.7)

rpm : 300.02nd speed

Rack travel in mm : 6.6...6.8 Del.quantity cm3/: 1.4...2.0

100 s: (1.1...2.2)

Spread cm3 : 0.4

100 s: (0.7)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

rpm : 300 1st speed

travel mm : 1.60...1.90

rpm : 450 2nd speed

: 3.00...3.40 travel mm

3rd speed : 750 rpm

: 5.20...5.60 travel mm

: 1050 4th speed rpm

: 7.90...8.10 travel mm

: 1120 5th speed morn : 9.50...9.90 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

Speed rpm : 1040

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Del.quantity : 133.0...135.0

1000 : (130.5...137.5)

Spread

cm3 : 4.00

1000 : (7.50)

RATED SPEED

1st version

Control lever

position degrees: 117...125

Testing:

1st rack travel in: 10.40

rpm : 1040...1050 Speed

2nd rack travel in: 5.50

Speed rpm : 1095...1125 4th rack travel in: 1250

Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever

position degrees: 85...93

Testing:

rpm : 100 Speed

Minimum rack trave: 8.20

Libu

Speed rpm : 300 Rack travel in mm : 6.60...6.80

CONSTANT REGULATION

rpm : 315...550 Speed

TORQUE CONTROL

Dimension a mm : 0.50

Torque control curve - 1st version

1st speed rpm : 1000

Rack travel in m: 11.40...11.50

rpm : 700 2nd speed

Rack travel in m: 11.70...11.80

3rd speed rpm : 900

Rack travel in m: 11.40...11.60

START CUT-OUT

1/min: 220 (240) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Speed : 700 rpm

Del.quantity cm3/: 139.0...145.0 1000 s: (136.0...148.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.40

Speed rpm : 1040...1050

**CO2** 

## STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quantity cm3/: 135.0...165.0

1000 s: (131.0...169.0)

Remarks:

Check electrically unlatched starting

fuel delivery (EES) with 24 volt.

BOSCH INJ. PLMP TEST SPECIFICATIONS

Note remarks

Test sheet : KHD

: 21.09.92 Edition

Replaces

Test oil : ISO-4113

: 0 401 840 765AB Combination no.

Injection pump

Pump designation : FE12P110A920LS3173

: 0 411 810 708 EP type number

Governor

Governor design. : RQV300...1000PA907

Governer no. : 0 421 813 729

Customer-spec. information

Customer : KHD

Engine : BF12L513

1st version kW : 298.0

Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Openina

pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter

x Wall thickness

x Length mm : 6.00x1.50x600

(A) Injection pump setting values

Insp. values in parentheses

Set equal delivery quant.

per values

BEGINNING OF DELIVERY

: 2.80...2.90 Prestroke mm

: (2.75...2.95)

Rack travel in mm : 9.00...12.00

: 1- 4- 9- 8- 5- 2-Firing order

11- 10- 3- 6- 7- 12

Phasing : 0-15-60-75-120-135-

180-195-240-255-300-

315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1000

Rack travel in mm : 10.80...10.90

Del.quantity cm3/: 11.8...12.0

100 s: (11.5...12.2)

cm3 : 0.4Spread

100 s: (0.7)

rpm : 300.0 2nd speed

Rack travel in mm: 6.6...6.8

Del.quantity cm3/: 1.4...2.0

100 s: (1.1...2.2)

Spread cm3 : 0.4

100 s: (0.7)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

rpm : 300 1st speed

: 1.60...1.90 travel mm

2nd speed rpm : 450

: 3.00...3.40 travel mm

3rd speed

rom : 750

travel mm : 5.20...5.60

4th speed rpm : 1050

travel mm : 7.90...8.10

5th speed : 1120 rpm

: 9.50...9.90 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

Speed rpm : 1040

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1000 Speed

: 118.0...120.0 Del.quantity

1000 : (115.5...122.5) Spread

: 4.00 cm3

1000 : (7.50)

RATED SPEED

1st version Control Lever

position degrees: 117...125

Testing:

1st rack travel in: 9.80

rpm : 1040...1050 Speed

2nd rack travel in: 5.50

Speed rpm : 1090...1120

4th rack travel in: 1250

rpm : 0.00...1.00 Speed

LOW IDLE 1

Control lever

position degrees: 85...93

Testing:

Speed ווסר : 100

Mirimum rack trave: 8.20

: 300 Speed rpm

Rack travel in mm : 6.60...6.80

CONSTANT REGULATION

Speed rpm : 315...550

TORQUE CONTROL

Dimension a mm : 0.20

Torque control curve - 1st version

1st speed opan : 1838

Rack travel in m: 10.80...10.90

2nd speed rpm : 700

Rack travel in m: 11.00...11.20

3rd speed rpm : 900

Rack travel in m: 10.80...11.00

START CUT-OUT

1/min : 220 (240) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 700

Del.quantity cm3/ : 123.0...129.0

1000 s: (120.0...132.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 9.80

Speed rpm : 1040...1050

**CO4** 

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 135.0...165.0

1000 s: (131.0...169.0)

Remarks:

Check electrically unlatched starting fuel delivery (EES) with 24 volt.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : KHD

: 21.09.92 Edition

Replaces

Test oil : ISO-4113

Combination no. : 0 401 840 765AC

Injection pump

Pump designation : PE12P11DA92OLS3173

: 0 411 810 708 EP type number

Governor

Governor design. : RQV300...1000PA907

Governer no. : 0 421 813 729

Customer-spec. information Customer : KHD

Engine : BF12L513

1st version kW : 284.0 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening |

pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_

BEGINNING OF DELIVERY

Prestroke mm : 2.80...2.90

: (2.75...2.95)

Rack travel in mm : 9.00...12.00

Firing order : 1- 4- 9- 8- 5- 211-10-3-6-7-12

Phasing : 0-15-60-75-120-135-

180-195-240-255-300-

315

: 0.50 (0.75) Tolerance + - °

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1000

Rack travel in mm : 10.30...10.40

Del.quantity cm3/: 11.1...11.3

100 s: (10.8...11.5)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rom : 300.0

Rack travel in mm: 6.6...6.8

Del.quantity cm3/: 1.4...2.0 100 s: (1.1...2.2)

cm3 : 0.4Spread

100 s: (0.7)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 1.60...1.90

2nd speed rpm : 450

3.00...3.40 travel mm

rpm : 750 3rd speed

travel mm : 5.20...5.60

rpm : 1050 4th speed

: 7.90...8.10 travel mm

rpm : 1120 5th speed

travel mm : 9.50...9.90

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1040 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

: 111.0...113.0 Del.quantity

1000 : (108.5...115.5)

Spread

cm3 : 4.00

1000 : (7.50)

RATED SPEED

1st version

Control lever

position degrees: 117...125

Testing:

1st rack travel in: 9.30

Speed rpm : 1040...1050

2nd rack travel in: 5.50

rpm : 1080...1110 Speed

4th rack travel in: 1250

rpm : 0.00...1.00Speed

LOW IDLE 1

Control lever

position degrees: 85...93

Testing:

Speed rpm : 100

Minimum rack trave: 8.20

rpm : 300

Rack travel in mm : 6.60...6.80

CONSTANT REGULATION

rpm : 315...550 Speed

TORQUE CONTROL

Dimension a mm : 0.20

Torque control curve - 1st version

1st speed rpm : 1000

Rack travel in m: 10.30...10.40

2nd speed rpm : 700

Rack travel in m: 10.50...10.70

3rd speed rpm : 900

Rack travel in m: 10.30...10.50

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 700

Del.quantity cm3/: 114.0...120.0 1000 s: (111.0...123.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 9.30

Speed

rpm : 1040...1050

006

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 135.0...165.0

1000 s: (131.0...169.0)

Remarks:

Check electrically unlatched starting

fuel delivery (EES) with 24 volt.

Test sheet : KHD

Edition : 21.09.92

Replaces

Test oil : ISO-4113

Combination no. : 0 401 840 765AD

Injection pump

Pump designation : PE12P110A920LS3173

EP type number : 0 411 810 708

Governor

Governor design. : RQV300...1000PA907

: 0 421 813 729 Governer no.

Customer spec information Customer : KHD

Engine : BF12L513

1st version kW : 270.0

Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

**Opening** 

pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter

x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values

Insp. values in parentheses Set equal delivery quant.

per values \_\_\_

BEGINNING OF DELIVERY

Prestroke mm : 2.80...2.90

: (2.75...2.95)

Rack travel in mm : 9.00...12.00

: 1- 4- 9- 8- 5- 2-Firing order

: 0-15-60-75-120-135-Phasing 180-195-240-255-300-

315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 10.00...10.10

Del.quantity cm3/: 10.6...10.8

100 s: (10.3...11.0)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 300.0

Rack travel in mm: 6.6...6.8

Del.guantity cm3/: 1.4...2.0

100 s: (1.1...2.2)

Spread cm3 : 0.4

100 s: (0.7)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 1.60...1.90

ripni : 450 2nd speed

travel mm : 3.00...3.40

3rd speed rpm : 750

5.20...5.60 travel mm

: 1050 4th speed rpm

: 7.90...8.10 travel mm

: 1120 5th speed rpm

: 9.50...9.90 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1 rpm : 1040 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed : 1000 rpm

Del.quantity : 106.0...108.0

1000 : (103.5...110.5)

: 4.00 Spread cm3 1000 : (7.50)

RATED SPEED

1st version Control lever

position degrees: 117...125

Testing:

1st rack travel in: 9.00

rpm : 1040...1050Speed

2nd rack travel in: 5.50

Speed rpm : 1080...1110

4th rack travel in: 1250

Speed rom : 0.00...1.00

LOW IDLE 1 Control lever

position degrees: 85...93

Testing:

Speed rpm : 100 Minimum rack trave: 8.20 rpm : 300

Rack travel in mm : 6.60...6.80

CONSTANT REGULATION

rpm : 315...550 Speed

TORQUE CONTROL

Dimension a mm : 0.20

Torque control curve - 1st version

rpm : 1000 1st speed

Rack travel in m: 10.00...10.10

rpm : 700 2nd speed

Rack travel in m: 10.20...10.40

3rd speed rpm : 900

Rack travel in m: 10.00...10.20

START CUT-OUT

1/min : 220 (240) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Speed : 700 rpm

Del.quantity cm3/: 108.0...114.0 1000 s: (105.0...117.0)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 9.00

rpm : 1040...1050 Speed

CO8

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 135.0...165.0

1000 s: (131.0...169.0)

Remarks:

Check electrically unlatched starting fuel delivery (EES) with 24 volt.

Test sheet : KHD

Edition : 21.09.92

Replaces

Test oil : ISO-4113

Combination no. : 0 401 840 765AF

Injection pump

Pump designation : PE12P110A920LS3173

EP type number : 0 411 810 708

Governor

Governor design. : RQV300...1000PA907

: 0 421 813 729 Governer no.

Customer-spec. information Customer : KHD

: BF12L513 Engine

1st version kW : 313.0

Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

**Opening** 

pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter

x Wall thickness

x Length mm : 6.00x1.50x600

(A) Injection pump secting values Insp. values in parentheses

Set equal delivery quant.

per values \_

BEGINNING OF DELIVERY

: 2.80...2.90 Prestroke mm

: (2.75...2.95)

Rack travel in mm : 9.00...12.00

Firing order : 1- 4- 9- 8- 5- 2-

Phasing : 0-15-60-75-120-135-

180-195-240-255-300-

315

Tolerance + - " : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1000

Rack travel in mm : 11.20...11.30

Del.quantity cm3/: 12.6...12.8

100 s: (12.3...13.0)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 300.0

Rack travel in mm : 6.6...6.8 Del.quantity cm3/: 1.4...2.0

100 s: (1.1...2.2)

Spread cm3 : 0.4

100 s: (0.7)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300

: 1.60...1.90 travel mm

2nd speed : 450 rpm

travel mm 3.00...3.40

: 750 3rd speed rpm travel mm

5.20...5.60 1050 4th speed rpm

7.90...8.10 travel mm

5th speed

: 1120 rpin travel mm

: 9.50...9.90

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1040 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Del.quantity : 126.0...128.0

1000 : (123.5...130.5) Spread

cm3 : 4.90

1000 : (7.50)

RATED SPEED

1st version

Control lever

position degrees: 117...125

Testing:

1st rack travel in: 10.20

ripo: : 1040...1050 Speed

2nd rack travel in: 5.50

rpm : 1090...1120 Speed

4th rack travel in: 1250

nom : 0.00...1.00 Speed

LOW IDLE 1

Control lever

position degrees: 85...93

Testina:

rpm : 100 Speed

Minimum rack trave: 8.20

rpm : 300 Speed

Rack travel in mm : 6.60...6.80

CONSTANT REGULATION

Speed rpm : 315...550

TORQUE CONTROL

Dimension a mm : 0.20

Torque control curve - 1st version

1st speed rpm : 1000

Rack travel in m: 11.20...11.30 ad speed rpm : 700

2nd speed

Rack travel in m: 11.40...11.60

3rd speed rpm : 900

Rack travel in m: 11.20...11.40

START CUT-OUT

1/min: 220 (240) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

rpm : 700 Speed

Del.quantity cm3/: 130.0...136.0 1000 s: (127.0...139.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 10.20

rpm : 1040...1050 Speed

C10

## STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 135.0...165.0 1000 s: (131.0...169.0)

Remarks:

Check electrically unlatched starting

fuel delivery (EES) with 24 volt.

Test sheet

: KHD

Edition

: 21.09.92

Replaces

Test oil

: ISO-4113

Combination no.

: 0 401 840 766AA

Injection pump

Pump designation : PE12P110A920LS3173

EP type number

: 0 411 810 708

Governor

Governor design. : RQV475...1075PA907-1

Governer no.

: 0 421 813 739

Customer

Customer-spec. information : KHD

Engine

: BF12L513

1st version kW

: 300.0

Rated speed

: 2150

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly

: 0 681 343 009

Opening

pressure, bar

: 172...175

Test lines

: 1 680 750 015

Outside diameter

x Wall thickness

x Length mm

: 6.00x1.50x600

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values \_

BEGINNING OF DELIVERY

Prestroke mm

: 2.80...2.90

Rack travel in mm : 9.00...12.00

: (2.75...2.95)

Firing order

: 1- 4- 9- 8- 5- 2-

C11

Phasing

: 0-15-60-75-120-135-180-195-240-255-300-

315

Tolerance + - °

: 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed

rpm: 1075

Rack travel in mm : 10.50...10.60

Del.quantity cm3/: 11.8...12.0

100 s: (11.5...12.2)

Spread

cm3 : 0.4

100 s: (0.7)

rpm : 475.0 2nd speed

Rack travel in mm : 6.4...6.6

Del.quantity cm3/: 1.7...2.3

100 s: (1.4...2.5) Spread cm3 : 0.4

100 s: (0.7)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 475

travel mm 2nd speed rpm : 650

: 1.10...1.50

travel mm

: 3.40...4.00

rpm : 950

3rd speed travel mm

: 5.60...6.20

4th speed rpm

: 1100

travel mm

: 7.70...7.90

5th speed rpm

: 1150

travel mm

: 8.80...9.20

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1120

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

Speed

rpm : 1075

Del.quantity

: 118.0...120.0

1000 : (115.5...122.5)

: 4.00 Spread cm3

1000 : (7.50)

RATED SPEED

1st version Control lever

position degrees: 115...123

Testina:

1st rack travel in: 9.50

rpm : 1095...1105 Speed

2nd rack travel in: 6.00

rpm : 1110...1140 Speed

4th rack travel in: 1250

mpm : 0.00...1.00Speed

LOW IDLE 1

Control lever position degrees: 85...93

Testing:

Speed : 100 mqn

Minimum rack trave: 8.00 rpm : 475 Speed

Rack travel in mm : 6.40...6.60

CONSTANT REGULATION

Speed rpm : 475...640

TORQUE CONTROL

Dimension a mm : 0.30

Torque control curve - 1st version

1st speed rpm : 1075

Rack travel in m: 10.50...10.60

2nd speed nom : 800

Rack travel in m: 10.80...11.00

3rd speed irpm : 1000

Rack travel in m: 10.60...10.80

START CUT-OUT

1/min: 395 (415) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 800 Del.quantity cm3/ : 125.0...131.0

1000 s: (122.0...134.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 9.50

rpm : 1095...1105 Speed

C12

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 135.0...165.0

1000 s: (131.0...169.0)

Remarks:

theck electrically unlatched starting fuel delivery (EES) with 24 volt.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet

: KHD

Edition

: 21.09.92

Replaces Test oil

: ISO-4113

Combination no. : 0 401 840 767AA

Injection pump

Pump designation : PE12P110A920LS3173

EP type number

: 0 411 810 708

Governor

Governor design. : RQ300/1150PA894-1

Governer no.

: 0 421 801 485

Customer

Customer-spec. information : KHD

Engine

: BF121.513 C

1st version kW

: 367.0

Rated speed

: 2300

TEST BENCH REQUIREMENTS

Test oil

inlet temp. \*C

: 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening

pressure, bar

: 172...175

Test Lines

: 1 680 750 015

Outside diameter

x Wall thickness

x Length mm

: 6.00x1.50x600

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values \_

BEGINNING OF DELIVERY

Prestroke mm

: 2.80...2.90

: (2.75...2.95)

Rack travel in mm : 9.00...12.00

Firing order

: 1- 4- 9- 8- 5- 2-

**C13** 

11-10-3-6-7-12

Phasina

: 0-15-60-75-120-135-

180-195-240-255-300-

315

Tolerance + - \*

: 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed

rpm: 1150

Rack travel in mm : 12.00...12.10

Del.quantity cm3/: 14.7...14.9

100 s: (14.4...15.1)

Spread

2nd speed

Spread

Speed

cra3 : 0.4

100 s: (0.7)

rpm : 300.0

Rack travel in mm : 6.6...6.8 Del.quantity cm3/ : 1.4...2.0 100 s: (1.1...2.2)

cm3 : 0.4

100 s: (0.7)

CUIDE SLEEVE POSITION

Control-lever position

Degree: -1

rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

rpm : 1150

Aneroid pressure h: 800 Del.quantity

: 147.0...149.0

1000 : (144.5...151.5)

Spread

cm3 : 4.00 1000 : (7.50)

RATED SPEED

1st version

Setting point:

Testing:

Speed

Speed

: 600 rpm

Rack travel in mm : 20.0

1st rack travel in: 11.00 rpm : 1195...1210

2nd rack travel in: 5.50

Speed rom : 1240...1270

4th rack travel in: 1350

Speed rpm : 0.00...1.00

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm: 300 Rack travel in mm: 6.7

Testing:

Speed : 100 CON Minimum rack trave: 8.20 rpm : 300

Rack travel in mm : 6.60...6.80 Rack travel in mm : 2.00

rpm : 390...430 Speed

TORQUE CONTROL

Dimension a mm

Torque control curve - 1st version

1st speed rpm : 1150

Rack travel in m: 12.00...12.10

2nd speed rpm : 750

Rack travel in m: 12.00...12.20

Ameroid/Altitude Compensator Test

1st version

Setting

Speed : 500 C CAD Pressure hPa : 870

: 12.00...12.10 Rack travel mm

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 10.60...10.80

2nd pressure hPa : 370

Rack travel in m: 11.70...11.80

3rd pressure hPa : 260

Rack travel in m: 11.00...11.20

START CUT-OUT

1/min: 220 (240) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: rpm : 450

Del.quantity cm3/: 108.0...112.0 1000 s: (105.5...114.5)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 11.00

Speed rpm : 1195...1210

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 135.0...165.0

1000 s: (131.0...169.0)

Remarks:

数heck electrically unlatched starting fuel delivery (EES) with 24 volt.

Test sheet : KHD

Edition : 21.09.92

Replaces

: 150-4113 Test oil

Combination no. : 0 401 840 767AB

Injection pump

Pump designation : PE12P110A920LS3173

EP type number : 0 411 810 708

Governor

Governor design. : RQ300/1150PA894-1

: 0 421 801 485 Governer no.

Customer-spec. information

Customer : KHD

Engine : BF12L513 C

1st version kW : 351.0

Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter

x Wall thickness

x Length mm : 6.00x1.50x600

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values \_

BEGINNING OF DELIVERY

Prestroke mm

: 2.80...2.90 : (2.75...2.95)

Rack travel in mm : 9.00...12.00

Firing order : 1- 4- 9- 8- 5- 2-

Phasing : 0-15-60-75-120-135-180-195-240-255-300-

315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1150

Rack travel in mm : 11.60...11.70

Del.quantity cm3/: 13.7...13.9

100 s: (13.4...14.1)

Spread cm3 : 0.4

100 s: (0.7)

rpm : 300.02nd speed

Rack travel in mm : 6.6...6.8 Del.quantity cm3/: 1.4...2.0

100 s: (1.1...2.2)

cm3 : 0.4Spread

100 s: (0.7)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

Aneroid pressure h: 800

: 137.0...139.0 Del.quaritity

1000 : (134.5...141.5)

cm3 : 4.00 1000 : (7.50) Spread

RATED SPEED

1st version

Setting point:

rpm Rack travel in mm : 20.0

Testing:

1st rack travel in: 10.60

rpm : 1195...1210 Speed

2nd rack travel in: 5.50

rpm : 1235...1265 Speed

4th rack travel in: 1350

Speed rom : 0.00...1.00

LOW IDLE 1

Setting point w/out bumper spring

rpm : 300 Speed Rack travel in mm: 6.7

Testing:

Speed rpm : 100 Minimum rack trave: 8.20 : 300 rom

Rack travel in mm : 6.60...6.80

Rack travel in mm : 2.00

rpm : 390...430 Speed

TORQUE CONTROL

Dimension a mm : -

Torque control curve - 1st version

1st speed rpm : 1150

Rack travel in m: 11.60...11.70

2nd speed rpm : 750

Rack travel in m: 11.60...11.80

Aneroid/Altitude Compensator Test

1st version

Setting

: 500 Speed rpin hPa : 800 Pressure

Rack travel mm : 11.60...11.70

Measurement

1/min : 500 Speed

1st pressure hPa : -

Rack travel in m: 10.60...10.80

2nd pressure hPa : 300

Rack travel in m: 11.30...11.40 3rd pressure hPa : 230 Rack travel in m: 10.80...11.00

START CUT-OUT

Speed 1/min: 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -Speed rpm : 450

Del.quantity cm3/: 108.0...112.0 1000 s: (105.5...114.5)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 10.60

rpm : 1195...1210 Speed

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 135.0...165.0 1000 s: (131.0...169.0)

Remarks:

Check electrically unlatched starting fuel delivery (EES) with 24 volt.

BOSCH INJ. PUMP TEST SPECIFICATIONS Firing order : 1-5-3-6-2-4 Note remarks Test sheet : STE 9,7 f 1 Phasing : 0-60-120-180-240-300 Edition : 05.10.92 Replaces : 02.89 Tolerance + - ° : 0.50 (0.75) Test oil : ISO-4113 Time to cyl. no. : 1 Combination no. : 0 401 846 554 BASIC SETTING Injection pump Pump designation : PE6P110A720RS516 1st speed rom: 1100 EP type number : 0 411 816 176 Governor Rack travel in mm: 14.40...14.50 Governor design. : R0300/1100PA412-2 : 0 421 801 435 Governer no. Del.quantity cm3/: 14.2...14.4 Customer-spec, information 100 s: (13.9...14.7) Customer : HAEP Spread cm3 : 0.4Engine : WD615.64 100 s: (0.7) 1st version kW : 175.0 Rated speed : 2200 rpm : 300.0 2nd speed Rack travel in mm: 6.4...6.6 TEST BENCH REQUIREMENTS Del.quantity cm3/ : 1.9...2.4 100 s: (1.6...2.6) Test oil cm3 : 0.4Spread inlet temp. °C : 38...42 100 s: (0.7) Overflow valve GUIDE SLEEVE POSITION : 1 417 413 025 Control-lever position Degree: -1 Inlet press., bar: 1.50 rpm : 600 Rack travel in mm: 19.20...20.80 Test nozzle holder assembly : 0 681 343 009 FULL LOAD DELIV. AT FULL LOAD STOP Opening 1st version pressure, bar : 172...175 Speed rpm : 1100 Aneroid pressure h: 900 : 142.0...144.0 1**000** : (139.0...147.0) Del. quantity Test lines : 1 680 750 089 : 4.00 Spread cm3 Outside diameter 1000 : (7.50) x Wall thickness x Length mm : 8.00x2.50x600 RATED SPEED (A) Injection pump setting values 1st version Insp. values in parentheses Set equal delivery quant. Setting point: per values Speed rpm Rack travel in mm : 20.0 BEGINNING OF DELIVERY Test pressure, bar: 25...27 Testing: 1st rack travel in: 13.40 : 2.80...2.90 Prestroke mm Speed rpm : 1145...1160 : (2.75...2.95) 2nd rack travel in: 4.00 Rack travel in mm : 9.00...12.00 Speed rpm : 1230...1260

4th rack travel in: 1300 Speed rpm : 0.00...1.00 LOW IDLE 1 Setting point w/out bumper spring rpm : 300° Rack travel in mm: 6.5 Testing: Speed npm : 100 Minimum rack trave: 8.00 rpm : 300 Speed Rack travel in mm : 6.40...6.60 Rack travel in mm: 2.00 Speed rpm : 400...440 TORQUE CONTROL Dimension a mm : 0.55 Torque control curve - 1st version 1st speed rpm : 1100 Rack travel in m: 14.40...14.50 2nd speed rpm : 700 Rack travel in m: 15.60...15.80 3rd speed rpm : 1000 Rack travel in m: 14.70...14.90 4th speed rpm : 860 Rack travel in m: 15.40...15.60 Aneroid/Altitude Compensator Test 1st version Settina Speed : 500 rpm hPa : 900 Pressure Rack travel mm : 15.60...15.30 Measurement  $1/\min : 500$ Speed 1st pressure hPa : -Rack travel in m: 13.10...13.30 2nd pressure hPa : 490 Rack travel in m: 15.00...15.10 3rd pressure hPa : 300 Rack travel in m: 13.60...13.80 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 900 rpm : 700 Speed Del.quantity cm3/: 160.0...164.0 1000 s: (157.0...167.0) Spread

Del.quantity cm3/: 116.0...118.0 1000 s: (113.0...121.0) Spread cm3 : 4.001000 s: (7.50) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 13.40 rpm : 1145...1160 Speed STARTING FUEL DELIVERY Speed : 100 rpm Del.quantity cm3/: 175.0...195.0 1000 s: (171.0...199.0) Remarks: Delivery-valve spring pre-tension = 2.40...2.60 mm. Permissible alteration from 2.20...2.90

cm3 : 6.001000 s: (9.) Aneroid pressure h: rpm : 500

Speed

**C18** 

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks : STE 10,0 g : 05.10.92 Test sheet Edition : 10.89 Replaces Test oil : ISO-4113 Combination no. : 0 401 846 912 Injection pump Pump designation : PE6P11DA72ORS3243 EP type number : 0 411 816 770 Governor Governor design. : R0300/1100PA412-4 Governer no. : 0 421 801 496 Customer-spec, information Customer : HAEP Engine : WD615.68 1st version kW : 228.0 : 2200 Rated speed TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder : 0 681 343 009 assembly Opening pressure, bar : 172...175 Test lines : 1 680 750 015 Outside diameter x Wall thickness : 6.00X1.50X600 x Length mm

(A) Injection pump setting values

per values \_\_\_

BEGINNING OF DELIVERY

Prestroke mm

Test pressure, bar: 25...27

Rack travel in mm : 9.00...12.00

Insp. values in parentheses Set equal delivery quant.

: 2.80...2.90

: (2.75...2.95)

: 0-60-120-180-240-300 Phasing Tolerance  $+ - ^{\circ} : 0.50 (0.75)$ Time to cyl. no. : 1 BASIC SETTING 1st speed rpm: 1100 Rack travel in mm : 13.70...13.80 Del.quantity cm3/: 18.3...18.5 100 s: (18.0...18.8) cm3 : 0.4Spread 100 s: (0.7) rpm : 300.02nd speed Rack travel in mm: 3.9...4.1 Del.quantity cm3/: 1.5...2.1 100 s: (1.2...2.4) cm3 : 0.4Spread 100 s: (0.7) GUIDE SLEEVE POSITION Control-lever position Degree: -1 rpm : 600 Speed Rack travel in mm : 15.40...16.60 FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 1100 Aneroid pressure h: 1200 Del.quantity : 183.0...185.0 1000 : (180.0...188.0) : 4.00 Spread cm3 1000 : (7.50) RATED SPEED 1st version Setting point: : 600 Speed rpm Rack travel in mm : 16.0 Testing: 1st rack travel in: 12.70 rpm : 1145...1160 Speed 2nd rack travel in: 4.00 rpm : 1240...1270 Speed

Firing order

: 1-5-3-6-2-4

4th rack travel in: 1350

Speed rpm : 0.00...1.00

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 300 Rack travel in mm: 4.0

Testing:

Speed : 100 rpm Minimum rack trave: 5.50 : 300 rpm

Rack travel in mm : 3.90...4.10 Rack travel in mm : 2.00

: 350...390 Speed תוכרו

Aneroid/Altitude Compensator Test

1st version

Setting

Speed rpm : 500 Pressure hPa : 1200

Rack travel mm : 13.70...13.80

Measurement

Speed 1/min: 500

1st pressure hPa : -

Rack travel in m: 9.80...10.00

2nd pressure hPa : 630

Rack travel in m: 12.90...13.00 3rd pressure hPa : 375 Rack travel in m: 10.70...10.90

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200

Speed rpm : 700 Del.quantity cm3/ : 193.0...197.0

1000 s: (190.0...200.0)

Aneroid pressure h: -

Speed rpm : 500 Del.quantity cm3/ : 119.0...121.0

1000 s: (116.0...124.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 12.70

rpm : 1145...1160 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 225.0...265.0 1000 s: (221.0...269.0)

Remarks:

Delivery-valve spring pre-tension =

2.40...2.60 mm.

Permissible alteration from 2.20...2.90

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : STE 10,0 h Edition : 05.10.92 : 10.89 Replaces

Test oil : ISO-4113

Combination no. : 0 401 846 913

Injection pump

Pump designation : PE6P110A720RS3243 : 0 411 816 770 EP type number

Governor

Governor design.: RQV250...1100PA413-5

: 0 421 813 811 Governer no.

Customer-spec. information Customer : HAEP

: WD615.68 Engine

1st version kW : 228.0 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2,90

: (2.75...2.95)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1100

Rack travel in mm : 13.70...13.80

Del.quantity cm3/: 18.3...18.5

100 s: (18.0...18.8)

Spread cm3 : 0.4

100 s: (0.7)

rpm : 250.0 2nd speed Rack travel in mm: 3.9...4.1 Del.quantity cm3/: 1.5...2.1 100 s: (1.2...2.4)

Spread cm3 : 0.4100 s: (0.7)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

rpm : 250 1st speed travel mm

: 0.90...1.30 2nd speed rpm : 350

travel mm : 1.70...2.30

rpm : 700 3rd speed

: 4.40...5.00 travel mm rpm : 1145 4th speed

travel mm : 8.30...8.50

5th speed rpm : 1250

travel mm : 9.50...9.90

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1 rpm : 1200 Speed

Rack travel in mm : 11.40...14.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1100 Speed Aneroid pressure h: 1200

Del.quantity : 103.0...188.0)

Spread cm3 : 4.00

1000 : (7.50)

RATED SPEED

1st version Control lever

position degrees: 102...110

Testing:

1st rack travel in: 12.70

Speed rpm : 1140...1150

2nd rack travel in: 4.00

Speed rpm : 1240...1270

4th rack travel in: 1350

Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever

position degrees: 68...76

Testing:

: 100 Speed rpm Minimum rack trave: 5.50 rpm : 250 Speed

Rack travel in mm: 3.90...4.10

CONSTANT REGULATION

Speed rpm : 250...350

Aneroid/Altitude Compensator Test

1st version

Setting

: 500 Speed rom . Pressure hPa : 1200

Rack travel mm : 13.70...13.80

Measurement

Speed 1/min: 500

1st pressure hPa : -

Rack travel in m: 9.80...10.00

2nd pressure hPa : 630

Rack travel in m: 12.90...13.00

3rd pressure hPa : 375

Rack travel in m: 10.70...10.90

START CUT-OUT

1/min: 170 (190) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Ameroid pressure h: 1200 Speed rpm : 700

Del.quantity cm3/: 193.0...197.0

1000 s: (190.0...200.0)

Aneroid pressure h: -

Speed rpm : 500 Del.quantity cm3/: 119.0...121.0 1000 s: (116.0...124.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.70

rpm : 1140...1150 Speed

STARTING FUEL DELIVERY

Speed : 100 LCIII

Del.quantity cm3/: 225.0...265.0

1000 s: (221.0...269.0)

Remarks:

Delivery-valve spring pre-tension =

2.40...2.60 mm.

Permissible alteration from 2.20...2.90

**C22** 

BOSCH INJ. PUMP TEST SPECIFICATIONS Firing order : 1-5-3-6-2-4 Note remarks Test sheet : SCA Phasina : 0-60-120-180-240-300 Edition : 21.09.92 Replaces Tolerance + - ° : 0.50 (0.75) Test oil : ISO-4113 Time to cyl. no. : 1 Combination no. : 0 401 846 926AA BASIC SETTING Injection pump Pump designation: PE6P110A720RS3040-2 1st speed rpm: 700 EP type number : 0 411 816 774 Governor Rack travel in mm : 12.30...12.40 Governor design. : RQV200...1000PA555-4 Governer no. : 0 421 813 878 Del.quantity cm3/: 17.1...17.3 Customer-spec. information 100 s: (16.9...17.5) Customer : SCANIA Spread cni3 : 0.6 Engine : DS11 100 s: (0.9) TEST BENCH REQUIREMENTS 2nd speed rpm : 325.0Test oil Rack travel in mm: 6.5...6.9 inlet temp. °C : 38...42 Dei.guantity cm3/: 2.0...2.4 Spread cm3 : 0.3Overflow valve 100 s: (0.6) : 1 417 413 025 (B) Setting of injection pump Inlet press., bar: 1.50 with governor Test nozzle holder GUIDE SLEEVE TRAVEL : 1 688 901 104 assembly 1st speed rpm : 225 travel mm : 1.10...1.50 Opening 2nd speed rpm : 350 pressure, bar : 250...253 : 2.30...2.90 travel mm rpm : 700 3rd speed Orifice plate : 4.70...5.30 travel mm diameter mm : 0,7 4th speed rpm : 1050 : 8.40...8.60 travel mm 5th speed : 1165 rpm Test Lines : 1 680 750 008 : 9.90...10.30 travel mm Outside diameter GUIDE SLEEVE POSITION x Wall thickness Control-lever position x Length mm : 6.00x2.00x600 Degree: -1 rpm : 1070 Speed (A) Injection pump setting values Rack travel in mm : 15.20...17.80 Insp. values in parentheses Set equal delivery quant. FULL LOAD DELIV. AT FULL LOAD STOP per values 1st version BEGINNING OF DELIVERY Speed rpm : 700 Test pressure, bar: 25...27 Aneroid pressure h: 900 Del.quantity : 171.0...173.0 1000 : (169.0...175.0) Prestroke mm : 3,30...3.40 : (3.25...3.45) Spread : 6.00 cm3 Rack travel in mm : 9.00...12.00

1000 : (9.00)

RATED SPEED

1st version

Control Lever

position degrees: 112...120

Testina:

1st rack travel in: 11.30

rpm : 1040...1050 Speed

2nd rack travel in: 4.00

rom : 1140...1170 Speed

4th rack travel in: 1250

rpm : 0.00,..1.00 Speed

LOW IDLE 1

Control lever

position degrees: 65...73

Testing:

Speed rpm : 100

Minimum rack trave: 8.20

Speed rpm : 325

Rack travel in mm : 6.50...6.70

Rack travel in mm: 2.00

Speed rpm : 400...460

Aneroid/Altitude Compensator Test

1st version

Setting

Speed : 500 rpm Pressure hPa : 900

: 12.30...12.40 Rack travel mm

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 9.80...10.20

2nd pressure hPa : 200 Rack travel in m: 11.70...11.80

3rd pressure hPa : 140

Rack travel in m: 10.70...10.90

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

rpm : 500 Speed

Del.quantity cm3/: 112.0...116.0

1000 s: (110.0...118.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 11.30

rpm : 1040...1050 Speed

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quantity cm3/: 240.0...290.0 1000 s: (-)

Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 325

Rack travel in mm : 6.50...6.70

Remarks:

Delivery-valve spring pre-tension

3.2...3.4 mm.

Permissible alteration of 3.0...3.5 mm

Start-of-delivery setting with ROBO

diaphragm.

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : HAE 12,0 a Edition : 05.10.92 Replaces : 03.92 Test oil : ISO-4113 : 0 401 846 933 Combination no. Injection pump Pump designation : PE6P110A320RS3260 EP type number : 0 411 816 775 Governor Governor design. : RQ250/1050PA969 Governer no. : 0 421 801 538 Customer-spec, information Customer : HAEP Engine : X6130 NA TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 419 992 198 Inlet press., bar: 1.50 Test nozzle holder assembly : 0 681 343 009 Opening : 172...175 pressure, bar Test lines : 1 680 750 089 Outside diameter x Wall thickness x Length mm : 8.00x2.50x600 (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

Phasing : 0-60-120-180-240-300 Tolerance + - ° : 0.50 (0.75) Time to cyl. no. : 1 BASIC SETTING ist speed rpm: 600 Rack travel in mm : 12.10...12.20 Del.quantity cm3/: 13.0...13.2 100 s: (12.7...13.4) Spread cm3 : 0.4100 s: (0.7) rpm : 250.0 2nd speed Rack travel in mm : 7.6...8.0 Del.quantity cm3/: 1.5...2.0 100 s: (1.2...2.2) Spread cm3 : 0.4 100 s: (0.7) GUIDE SLEEVE POSITION Control-lever position Degree: -1 rpm : 500 Speed Rack travel in mm : 12.60...14.20 FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 600 Del.quantity : 130.0...132.0 : (127.5...134.5) 1000 : 4.00 Spread cm3 1000 : (7.50) RATED SPEED 1st version Setting point: Speed rpm Rack travel in mm: 13.4 Testing: 1st rack travel in: 10.40 : 1085...1100 Speed rpm 2nd rack travel in: 4.00 rpm : 1110...1140 Speed 4th rack travel in: 1250

Speed

LOW IDLE 1

man

: 0.00...1.80

per values

Test pressure, bar: 25...27

Rack travel in mm : 9.00...12.00

: 3.60...3.70

: (3.55...3.75)

: 1-5-3-6-

BEGINNING OF DELIVERY

Prestroke mm

Firing order

Control lever position degrees: 73...81 Testing: Speed : 100 CDM Minimum rack trave: 9.30 Speed rpm : 250 Rack travel in mm : 7.70...7.90 Rack travel in mm: 2.00 rom : 295...335 Speed TORQUE CONTROL Dimension a mm :? Torque control curve - 1st version 1st speed rpm : 1035 Rack travel in m: 11.30...11.50 2nd speed rpm : 600 Rack travel in m: 12.10...12.20 FUEL DELIVERY CHARACTERISTICS 1st version Speed rpm : 1035 Del.quantity cm3/: 129.5...133.5 1000 s: (127.0...135.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 10.40 rpm : 1085...1100 Speed STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/ : 180.0...200.0 1000 s: (176.0...204.0) LOW IDLE Speed rpm : 250 Rack travel in mm : 7.60...8.00

Del.quantity cm3/: 15.0...20.0 1000 s: (12.5...22.5)

cm3 : 4.50Spread 1000 s: (7.50)

Remarks:

**CS9** 

BOSCH INU. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : SCA

Edition : 21.09.92

Replaces

Test oil : ISO-4113

Combination no. : 0 401 846 950

Injection pump

Pump designation: PE6P110A720RS3289

: 0 411 816 781 EP type number

Governor

Governor design. : RQV200...1100PA555-5

: 0 421 813 943 Governer no.

Customer-spec. information

Customer : SCANIA

: DS11 63A Engine

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 104 assembly

Opening.

: 250...253 pressure, bar

Orifice plate

diameter mm : 0.7

Test lines : 1 680 750 008

Outside diameter

x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 3.30...3.40 Prestroke mm

: (3.25...3.45)

Rack travel in mm : 9.00...12.00

Firing order : 1-5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 700

Rack travel in mm : 12.30...12.40

Del.quantity cm3/: 17.1...17.3

100 s: (16.9...17.5)

Spread cm3 : 0.6

100 s: (0.9)

rpm : 325.02nd speed

Rack travel in mm: 6.5...6.9 Del.quantity cm3/: 2.0...2.4

Spread cm3 : 0.3

100 s: (0.6)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250

: 0.70...1.10 travel mm

2nd speed rpm : 350

travel mm : 2.00...2.60

3rd speed rpm : 650

: 4.90...5.50 travel mm

4th speed : 1145 rpm

travel mm : 8.30...8.50

rpm : 1300 5th speed

travel mm : 9.70...10.10

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

rpm : 1130 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Aneroid pressure h: 900

: 171.0...173.0 Del.quantity

1000 : (169.0...175.0)

Spread cm3 : 6.00

1000 : (9.00)

RATED SPEED

1st version

Control Lever

position degrees: 112...120

Testing:

1st rack travel in: 11.30

Speed rpm: 1140...1150 2nd rack travel in: 4.00

rpm : 1280...1310 Speed

4th rack travel in: 1420

Speed rpm : 0.00...1.00

LOW IDLE 1 Control Lever

position degrees: 65...73

Testing:

Speed : 100 rpm -Minimum rack trave: 8.20

Speed : 325 rpm

Rack travel in mm : 6.50...6.70

Rack travel in mm: 2.00

Speed : 400...450 CIDITI

Aneroid/Altitude Compensator Test

1st version

Setting

Speed : 500 COM Pressure hPa : 900

Rack travel mm : 12.30...12.40

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 9.80...10.20

2nd pressure hPa : 200

Rack travel in m: 11.70...11.80

3rd pressure hPa : 140

Rack travel in m: 10.70...10.90

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900 Speed rpm\_ : 1100

Del.quantity cm3/: 160.0...168.0

1000 s: (158.0...170.0)

Aneroid pressure h: -

Speed rpm : 500 Del.quantity cm3/ : 112.0...116.0 1000 s: (110.0...118.0)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 11.30

Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed : 100 rpm

Del.quantity cm3/: 240.0...290.0 Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 325

Rack travel in mm : 6.50...6.70

Remarks:

Delivery-valve spring pre-tension

3.2...3.4 mm.

Permissible alteration of 3.0...3.5 mm

Start-of-delivery setting with ROBO diaphragm.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet

: DAF

Edition

: 05.10.92

Replaces

: 04.92

Test oil

: ISO-4113

Combination no.

: 0 401 846 964

Injection pump

Pump designation : PE6P110A320RS3302

EP type number

: 0 411 816 787

Governor

Governor design. : RQ300/1000PA1012-1

Governer no.

: 0 421 801 648

Customer-spec. information Customer

: DAF

Engine

: LT 195 L

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 101 assembly

Opening

pressure, bar

: 207...210

Orifice plate

diameter mm

: 0,6

Test lines

: 1 680 750 089

Outside diameter

x Wall thickness

x Length mm

: 8.00x2.50x600

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values \_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 3.70...3.80

: (3.65...3.85)

Rack travel in mm : 14.00...15.00

D01

Firing order

: 1-5-3-6-2-4

Phasing

: 0-60-120-180-240-300

Tolerance  $+ - \circ : 0.50 (0.75)$ 

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 3.90...4.10

& maximum rack tra: 13.9...14.9 Difference ° CS : 3.00...5.00

BASIC SETTING

1st speed

rpm: 850

Rack travel in mm : 14.40...14.50

Del.quantity cm3/: 17.3...17.5

100 s: (17.0...17.7)

cm3 : 0.4

Spread

100 s: (0.7)

2nd speed

rpm : 300.0

Rack travel in mm: 5.5...5.7 Del.quantity cm3/: 1.6...2.1

100 s: (1.4...2.4)

Spread

Speed

cm3 : 0.4

100 s: (0.7)

GUIDE SLEEVE POSITION Control-Lever position

Degree: -1

rpm : 600

Rack travel in mm: 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

rpm : 850

Aneroid pressure h: 1000

Del.quantity

: 173.0...175.0 1000 : (170.5...177.5)

Spread

: 4.00 cm3

1000 : (7.50)

RATED SPEED

1st version

Speed

Setting point:

rom

Rack travel in mm: 20.0

: 600

Testing:

1st rack travel in: 13.40

rom : 1025...1040 Speed

2nd rack travel in: 4.00

: 1105...1135 Speed rpm

4th rack travel in: 1300

rom : 0.00...1.50 Speed

LOW IDLE 1

Setting point w/out bumper spring

rpm : 300 Rack travel in mm : 5.6

Testina:

Speed rpm : 100 Minimum rack trave: 10.00 ; 300 Speed rpm

Rack travel in mm : 5.50...5.70 Rack travel in mm : 2.00

: 330...370 Speed חכרו

TORQUE CONTROL

Dimension a mm ...

Torque control curve - 1st version

rpm : 850 1st speed

Rack travel in m: 15.10...15.20

2nd speed rpm : 1000

Rack travel in m: 15.00...15.20

Aneroid/Altitude Compensator Test

1st version

Setting

Speed rom : 600 Pressure hPa : 1000

Rack travel mm : 14.40...14.50

Measurement

Speed 1/min: 600

1st pressure hPa : -

Rack travel in m: 12.30...12.50

2nd pressure hPa : 530

Rack travel in m: 13.90...14.00

3rd pressure hPa : 380

Rack travel in m: 12.90...13.10

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

rpm : 600

Del.quantity cm3/: 131.0...133.0 1000 s: (128.5...135.5)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 13.40

rpm : 1025...1040 Speed

STARTING FUEL DELIVERY

Speed rom : 100

Del.quantity cm3/: 330.0...370.0 1000 s: (327.0...373.0)

Rack travel in mm : 19.50...21.00

LOW IDLE

rpm

Speed rpm : 300 Rack travel in mm : 5.50...5.70 Del.quantity cm3/: 16.5...21.5

1000 s: (14.0...24.0)

cm3 : 4.50 Spread

1000 s: (7.50)

Remarks:

Check electrically unlatched starting fuel delivery (EES) with 24 volt.

On activation of the starting solenoid, the start position must be reached.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet

Edition : 21.09.92

Replaces

Test oil : ISO-4113

Combination no. : 0 401 846 967

Injection pump

Pump designation : PE6P110A320LS3851-2

EP type number : 0 411 816 785

Governor

: RQV350...1050PA378 Governor design.

-12

Governer no. : 0 421 814 016

Customer-spec. information

Customer : MERCEDES-BENZ

Engine : OM441

1st version kW : 151.0 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 1 688 901 101 assembly

**Openina** 

pressure, bar : 207...210

Orifice plate

diameter mm : 0,6

Test Lines : 1 680 750 008

Outside diameter x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 4.40...4.50 Prestroke mm

: (4.35...4.55)

Rack travel in mm : 9.00...12.00

: 6-3-5-2-4-1 Firing order

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : ს

BASIC SETTING

1st speed rpm: 1050

Rack travel in mm : 12.20...12.30

Del.quantity cm3/: 11.8...12.0

100 s: (11.5...12.2)

Spread cm3 : 0.8

100 s: (1.3)

2nd speed rem : 350.0

Rack travel in mm: 7.1...7.7

Del.quantity cm3/: 1.6...2.2

100 s: (1.3...2.4) cm3 : 0.6

Spread 100 s: (1.1)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350

: 1.80...2.30 travel mm 2nd speed rpm : 455

travel mm : 3.40...3.90

3rd speed rpm : 880

travel mm : 5.60...6.10

rom : 1107 4th speed

travel mm : 8.00...8.50

: 1209 5th speed rpm

: 9.80...10.20 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

Speed rpm : 1130

Rack travel in mm : 9.90...12.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version rpm : 1050 Speed : 118.0...120.0 Del.quantity 1000 : (115.5...122.5) cm3 : 8.50 1000 : (13.00) Spread RATED SPEED 1st version Control Lever position degrees: 116...124 Testing: 1st rack travel in: 11.20 rpm : 1090...1100 Speed 2nd rack travel in: 4.00 rpm : 1160...1190 Speed 4th rack travel in: 1300 Speed rpm : 0.00...1.40 LOW IDLE 1 Control Lever position degrees: 67...75 Testing: Speed : 250 rpm Minimum rack trave: 10.00 CONSTANT REGULATION Speed rpm : 350...450 START CUT-OUT Speed 1/min : 270 (290) FUEL DELIVERY CHARACTERISTICS 1st version : 600 Speed rpm Del.quantity cm3/: 119.0...125.0 1000 s: (116.5...127.5) Spread cm3 : 11.00 1000 s: (14.) Speed rpm : 1050
Del.quantity cm3/ : 88.0...90.0 \* 1000 s: (85.5...92.5) cm3 : 11.00 Spread 1000 s: (14.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 11.20

rpm : 1090...1100

Speed

004

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 130.0...150.0

1000 s: (126.0...154.0)

Remarks:

\* = Set at reduced-delivery stop.

BOSCH INJ. PUMP TEST SPECIFICATIONS : 3.70...3.80 : (3.65...3.85) Prestroke mm Note remarks Rack travel in mm : 13.00...14.00 Firing order : 1-8-7-2-6-5-Test sheet : KHD 12,8 c1 Edition : 25.09.92 Replaces : 01.92 Test oil : ISO-4113 Phasing : 0-45-90-135-180-225-Combination no. : 0 401 848 820 270-315 Tolerance + - ° : 0.50 (0.75)Injection pump Pump designation : PE8P12OA720LS3281-1 Time to cyl. no. : 1 EP type number : 0 411 828 727 Governor BASIC SETTING Governor design. : RQV300...1050PA1009 Governer no. : 0 421 813 938 1st speed rpm: 1050 Customer-spec. information Rack travel in mm: 12.70...12.80 Customer : KHD Del.quantity cm3/: 18.6...18.8 Engine : BF8L513LC 100 s: (18.3...19.1) 1st version kW : 243.0 Rated speed : 2100 Spread cm3 : 0.5TEST BENCH REQUIREMENTS 100 s: (0.9) Test oil 2nd speed rpm : 300.0inlet temp. °C Rack travel in mm : 5.9...6.1 Del.quantity cm3/ : 3.0...3.6 : 38...42 Overflow valve 100 s: (2.7...3.9) : 1 417 413 025 Spread cm3 : 0.8100 s: (1.2) Inlet press., bar: 1.50 (B) Setting of injection pump Test nozzle holder with governor : 1 688 901 019 assembly GUIDE SLEEVE TRAVEL Openina rom : 3001st speed : 207...210 pressure, bar travel mm : 2.40...2.80 rpm : 450 2nd speed Orifice plate : 3.40...4.00 travel mm : 725 diameter mm : 0,8 3rd speed man : 5.30...5.90 travel mm rpm : 1100 4th speed Test Lines : 1 680 750 075 travel mm : 9.10...9.30 5th speed rpm : 1175 Outside diameter : 10.00...10.40 travel mm x Wall thickness x Length mm

: 8.00x2.50x1000 GUIDE SLEEVE POSITION Control-lever position (A) Injection pump setting values Degree: -1 rpm : 1070 Speed Rack travel in mm : 15.20...17.80

Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY Test pressure, bar: 25...27 FULL LOAD DELIV. AT FULL LOAD STOP 1st version

rpm : 1050

Speed

Aneroid pressure h: 850 Del.quantity : 186.0...188.0 1000 : (183.0...191.0) : 5.00 Spread cm3 1000 : (9.00) RATED SPEED 1st version Control lever position degrees: 119...127 Testing: 1st rack travel in: 11.70 Speed rpm : 1090...1100 2nd rack travel in: 4.00 rpm : 1180...1210 Speed 4th rack travel in: 1350 Speed rpm : 0.00...1.00 LOW IDLE 1 Control Lever position degrees: 86...94 Testina: Speed : 100 rpm Minimum rack trave: 7.50 rpm : 300 Rack travel in mm : 5.90...6.10 CONSTANT REGULATION rpm : 300...500 Speed TORQUE CONTROL Dimension a mm : 0.30 Torque control curve - 1st version rpm : 1050 1st speed Rack travel in m: 12.70...12.80 2nd speed rpm : 650 Rack travel in m: 12.90...13.10 3rd speed rpm : 775 Rack travel in m: 12.80...13.00 Aneroid/Altitude Compensator Test 1st version Setting Speed : 500 rpm Pressure hPa : 850 : 12.70...12.80 Rack travel mm Measurement Speed  $1/\min : 500$ 

3rd pressure hPa : 310 Rack travel in m: 12.00...12.10 START CUT-OUT Speed 1/min : 220 (240) FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 850 Speed rpm : 650 Del.quantity cm3/: 186.0...190.0 1000 s: (183.0...193.0) Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/: 124.0...126.0 1000 s: (121.0...129.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 11.70 rpm : 1090...1100 Speed STARTING FUEL DELIVERY Speed (COM) Del. quantity cm3/: 175.0...195.0 1000 s: (175.0...195.0) Remarks: Check electrically unlatched starting fuel delivery (EES) with 24 volt. On activation of the starting solenoid, the start position must be reached.

1st pressure hPa : -

2nd pressure hPa : 450

Rack travel in m: 11.30...11.50

Rack travel in m: 12.50...12.60

BOSCH INU. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet

: HAE

Edition

: 05.10.92

Replaces

Test oil

: ISO-4113

Combination no. : 0 401 856 159

Injection pump

Pump designation : PE6P110A721RS369

EP type number Governor

: 0 411 816 121

Governor design. : RQ300/1300PA412-6

Governer no.

: 0 421 801 638

Customer-spec, information Customer

: HAEP

Engine

: WD615.60

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly

: 0 681 343 009

Opening

pressure, bar

: 172...175

Test lines

: 1 680 750 089

Outside diameter x Wall thickness

x Length mm

: 8.00X2.50X600

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 2.80...2.90

: (2.75...2.95)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6Phasing

: 0-60-120-180-240-300

Tolerance + - °

: 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed

rpm: 1300

Rack travel in mm : 14.10...14.20

Del.quantity cm3/: 14.6...14.8

100 s: (14.3...15.0)

Spread

cm3 : 0.4

100 s: (0.7)

2nd speed

rpm : 300.0

Rack travel in mm : 8.8...9.2

Del.quantity cm3/: 1.8...2.4 100 s: (1.5...2.6)

Spread

Speed

cm3 : 0.4

100 s: (0.7)

GUIDE SLEEVE POSITION

Control-lever position

Dearee: -1

rpm : 600

Rack travel in mm : 15.80...17.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300 Aneroid pressure h: 700

Del.quantity

: 146.0...148.0 1000 : (143.5...150.5)

Spread

cm3

: 4.00

1000 : (7.50)

RATED SPEED

1st version

Setting point:

rpm

: 600

Rack travel in mm: 16.4

Testina:

Speed

1st rack travel in: 13.10

Speed rpm: 1345...1360 2nd rack travel in: 4.00

Speed rpm : 1425...1455 4th rack travel in: 1550

rpm : 0.00...1.40

007

LOW IDLE 1 Setting point w/out bumper spring ripm : 300 Rack travel in mm: 6.0 Testing: Speed : 100 rpm Minimum rack trave: 7.40 : 300 rpm Rack travel in mm : 5.90...6.10 Rack travel in mm : 2.00 Speed rpm : 400...440 TORQUE CONTROL Dimension a mm : 0.40 Torque control curve - 1st version rpm : 1300 1st speed Rack travel in m: 14.10...14.20 2nd speed rpm : 700 Rack travel in m: 14.60...15.00 3rd speed rpm : 900 Rack travel in m: 14.50...14.70 4th speed rpm : 1100 Rack travel in m: 14.30...14.50 Aneroid/Altitude Compensator Test 1st version Setting : 700 Speed rpm Pressure hPa : 700 : 14.30...14.50 Rack travel mm

Measurement Speed 1/min: 700

1st pressure hPa : -Rack travel in m: 12.40...12.60 2nd pressure hPa : 310 Rack travel in m: 14.10...14.20 3rd pressure hPa : 205 Rack travel in m: 12.70...12.90

FUEL DELIVERY CHARACTERISTICS

1st version Aneroid pressure h: 700 Speed : 700 rpm Del.quantity cm3/: 135.0...139.0 1000 s: (132.0...142.0) Aneroid pressure h: rpm\_ : 700 Del.quantity cm3/: 101.0...103.0 1000 s: (98.5...105.5)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 13.10 Speed rpm : 1345...1360

STARTING FUEL DELIVERY

: 100 Speed rpm Del.quantity cm3/: 135.0...155.0 1000 s: (131.0...159.0) Rack travel in mm : 16.50...17.50

Remarks:

80d

BOSCH INU. PUMP TEST SPECIFICATIONS Prestroke mm : 3.80...3.90 : (3.75...3.95) Note remarks Rack travel in mm : 9.00...12.00 Firing order : 1-6-3-5-2-4 Test sheet : LIE : 21.09.92 Edition Replaces Test oil : ISO-4113 Phasing : 0-75-120-195-240-315 Combination no. : 0 401 876 770B Tolerance + - \* : 0.50 (0.75) Injection pump Time to cyl. no. : 1 Pump designation: PE6P110A320LS3852 EP type number : 0 411 816 768 BASIC SETTING Governor Governor design.: RSV400...900P1A544 1st speed rpm: 900 Governer no. : 0 421 833 326 Rack travel in mm : 12.50...12.60 Cust. part no. : 9270100 Del.quantity cm3/: 14.8...15.0 Customer-spec. information Customer : LIEBHERR 100 s: (14.5...15.2) Engine : D 9306 T Spread cm3 : 0.41st version kW : 172.0 100 s: (0.7) Rated speed : 1800 2nd speed rpm : 400.0TEST BENCH REQUIREMENTS Rack travel in mm : 5.8...6.0 Del.quantity cm3/: 1.3...1.8 Test oil 100 s: (1.0...2.0) inlet temp. °C : 38...42 **Eserga** cm3 : 0.4100 s: (0.7) Overflow valve : 1 417 413 025 GUIDE SLEEVE POSITION Control-lever position Inlet press., bar: 1.50 Degree: -3 Speed rpm : 800 Test nozzle holder Rack travel in mm : 0.30...0.70 assembly : 0 681 343 009 Governor spring pre-tension **Opening** Click setting x : 2.50 pressure, bar : 172...175 FULL LOAD DELIV. AT FULL LOAD STOP Test lines : 1 680 750 015 1st version Speed rpm : 900Outside diameter Del.quantity : 148.0...150.0 x Wall thickness 1000 : (145.5...152.5) x Length mm : 6.00x1.50x600 Spread cm3 : 4.00 1000 : (7.50)(A) Injection pump setting values Insp. values in parentheses RATED SPEED Set equal delivery quant. per values \_\_\_\_ 1st version

Control lever

Testina:

position degrees: 88...96

1st rack travel in: 11.50

009

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Speed rpm : 930...940 2nd rack travel in: 4.00 Speed : 945...975 rpm 3rd rack travel in: 4.00 rpm : 950...980 Speed 4th rack travel in: 1120 riom : 0.30...1.40 Speed LOW IDLE 1 Control lever position degrees: 66...74 Setting point w/out bumper spring Speed rpm : 400 Rack travel in mm: 5.4 Speed : 400 mqn. Rack travel in mm : 5.80...6.00 Rack travel in mm : 2.00 rpm : 450...510 Speed TORQUE CONTROL Torque control curve - 1st version nom : 900 1st speed Rack travel in m: 12.50...12.60 rpm : 500 2nd speed Rack travel in m: 12.50...12.70 3rd speed rpm : 420 Rack travel in m: 13.70...14.30 FUEL DELIVERY CHARACTERISTICS 1st version rpm : 500 Speed Del.quantity cm3/: 144.0...148.0 1000 s: (141.0...151.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 11.50 Speed rpm : 930...940 STARTING FUEL DELIVERY Speed : 100 MOC Del.quantity cm3/: 150.0...170.0 1000 s: (146.0...174.0) LOW IDLE Speed rpm : 400 Rack travel in mm : 5.80...6.00 Del.quantity cm3/ : 13.0...18.0 1000 s: (10.5...20.5) Spread cm3 : 4.501000 s: (7.50)

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS : 4.00...4.10 Prestroke mm : (3.95...4.15) Note remarks Rack travel in mm : 9.00...12.00 Firina order : 6-3-5-2-4-1 Test sheet : MB 11,0 z : 25.09.92 Edition : 06.91 Replaces Test oil : ISO-4113 Phasing : 0-60-120-180-240-300 Combination no. : 0 401 876 775 Tolerance + - ° : 0.50 (0.75) Injection pump Time to cyl. no. : 6Pump designation : PE6P110A320LS3835-3 EP type number : 0 411 816 773 BASIC SETTING Governor Governor design. : RSV350...1050P0A556 1st speed rpm : 1030Governer no. : 0 421 833 388 Rack travel in mm : 13.50...13.60 Customer-spec. information Customer : MERCEDES-BENZ Del.quantity cm3/: 13.6...13.8 Engine : OM 441 100 s: (13.3...14.0) 1st version kW : 165.0 Spread cm3 : 0.4Rated speed : 2100 100 s: (0.8) TEST BENCH REQUIREMENTS 2nd speed rpm : 350.0 Test oil Rack travel in mm : 8.3...8.9 inlet temp. °C : 38...42 Del.quantity cm3/ : 1.2...1.8 100 s: (0.9...2.0) Overflow valve cm3 : 0.4Spread : 1 417 413 025 100 s: (0.7) Inlet press., bar: 1.50 GUIDE SLEEVE POSITION Control-lever position Overflow Degree: -3 quantity min. 1/h: 100...120 Speed rpm : 800 Rack travel in mm : 0.30...0.70 Test nozzle holder : 0 681 343 009 assembly Governor spring pre-tension Click setting x :? Opening pressure, bar : 172...175 FULL LOAD DELIV. AT FULL LOAD STOP 1st version Test lines : 1 680 750 089 rpm : 1030 Speed : 136.0...138.0 Del.quantity Outside diameter 1000 : (133.5...140.5) x Wall thickness : 4.00 Spread cm3 x Length mm : 8.00x2.50x600 1000 : (8.00)

(A) Injection pump setting values RATED SPEED

Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY Test pressure, bar: 25...27

Testing: 1st rack travel in: 12.50

position degrees: 88...96

1st version

Control lever

rpm : 1070...1080 Speed 2nd rack travel in: 4.00 Speed rpm : 1130...1160 4th rack travel in: 1300 Speed rpm : 0.30...1.40LOW IDLE 1 Control lever position degrees: 64...72 Setting point w/out bumper spring Speed rpm : 350 Rack travel in mm: 8.6 Testing: Screed : 100 rpm Minimum rack trave: 19.50 : 350 Speed rpm Rack travel in mm : 8.50...8.70 Rack travel in mm: 2.00 Speed : 380...440 COM SET IDLE AUXILIARY SPRING Rack travel in mm: 2.00 FUEL DELIVERY CHARACTERISTICS 1st version Speed : 750 rpm Del.quantity cm3/: 124.0...128.0 1000 s: (121.0...131.9) Spread cm3 : 6.001000 s: (8.00) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 12.50 Speed rpm : 1070...1036 STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/ : 140.0...160.0 1000 s: (136.0...164.0)

Observe VDT-I-420/120

D12

Remarks:

 $n = 1030 \, 1/min.$ 

specifications.

Set 14.1...14.3 mm control-rod travel

Make full-load setting at upper fullload stop in accordance with test

at lower full-load stop with

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : MB 14,7 s 3 Edition : 21.09.92 Replaces Test oil : ISO-4113 Combination no. : 0 401 878 716 Injection pump Pump designation : PE8P110A320LS3842-1 EP type number : 0 411 818 716 Governor Governor design. : RSV675...1050POA823 : 0 421 833 365 Governer no. Customer-spec, information Customer : MERCEDES-BENZ Engine : 0M442 1st version kW : 213.0 Rated speed : 2100 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 33...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Overflow quantity min. 1/h: 100...120 Test nozzle holder : 0 631 343 009 assembly Openina pressure, bar : 172...175 Test Lines : 1 680 750 015 Outside diameter x Wall thickness : 6.00X1.50X600 x Length mm

: 4.00...4.10 Prestroke mm : (3.95...4.15) Rack travel in mm : 9.00...12.00 : 8-7-2-6-3-5-Firing order Phasing : 0-45-90-135-180-225-Phasing : 270-315 Tolerance + - ° : 0.50 (0.75) Time to cyl. no. : 8 BASIC SETTING 1st speed rpm : 1030Rock travel in mm : 13.00...13.10 Del.quantity cm3/: 14.1...14.3 100 s: (13.8...14.5) Spread cm3 : 0.4100 s: (0.7) 2nd speed rpm : 675.0 Rack cravel in mm: 4.8...5.4 Del.quantity cm3/: 1.5...2.1 100 s: (1.2...2.3) cm3 : 0.4 Spread 100 s: (0.7) GUIDE SLEEVE POSITION Control-lever position Degree: -3 rpm : 800 Speed Rack travel in mm : 0.30...0.70 Governor spring pre-tension Click setting x : ?FULL LOAD DELIV. AT FULL LOAD STOP 1st version rpm : 1030 Speed : 141.0...143.0 Del.quantity 1000 : (138.5...145.5) : 4.00 Spread cm3 1000 : (7.00) RATED SPEED

1st version Control lever

position degrees: 88...96

BEGINNING OF DELIVERY Test pressure, bar: 25...27

per values

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

Testing:

1st rack travel in: 12.00

Speed rpm : 1070...1080

2nd rack travel in: 4.00

Speed rpm : 1100...1118 4th rack travel in: 1350 Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever

position degrees: 72...80 Setting point w/out bumper spring

rpm : 675 Rack travel in mm: 5.1

Testina:

Speed : 100 nom: Minimum rack trave: 15.00

Speed : 675 וחסרו

Rack travel in mm : 4.80...5.40

SET IDLE AUXILIARY SPRING

Rack travel in mm: 2.00

FUEL DELIVERY CHARACTERISTICS

1st version

: 750 Speed rpm

Speed rum : 750

Del.quantity cm3/: 132.0...136.0

1000 s: (129.0...139.0)

Spread cm3 : 5.00

1000 s: (8.00)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 12.00

Speed npm : 1070...1080

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 140.0...160.0 1000 s: (136.0...164.0)

Remarks:

**APPLICATION** 

Combine harvester

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAN 11,9 r2 Edition : 14.10.92 Replaces : 18.02.91

Replaces : 18.02.91 Test oil : ISO-4113

combination no. : 0 402 036 735

Injection pump

Pump designation : PES6P120A720/3LS3250

-1

EP type number : 0 412 026 742

Governor

Governor design. : RQ300/1000PA813-13

Governer no. : 0 421 801 529

Customer spec. information Customer : MAN

Engine : D2866LF03/LUH01

1st version kW : 273.0 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil

inler temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 1 688 901 019

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter x Wall thickness

x Length mm : 6.00x1.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.70...3.80

Rack travel in mm : 14.50...15.50 Firing order : 6-2-4-1-5-3

Phasing : 0-60-120-180-240-300

Tolerance  $+ - \cdot : 0.50 (0.75)$ 

Time to cyl. no. : 6

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 5.90...6.10 & maximum rack tra: 14.5...15.5 Difference ° CS : 2.00...4.00

BASIC SETTING

1st speed rpm: 700

Rack travel in mm : 15.00...15.10

Del.quantity cm3/: 24.2...24.4

100 s: (23.9...24.7)

Spread cm3: 0.5

100 s: (0.9)

2nd speed rpm : 300.0 Rack travel in mm : 4.8...5.2 Del.quantity cm3/ : 1.7...2.3

100 s: (1.4...2.6)

Spread cm3 : 0.8

100 s: (1.2)

GUIDE SLEEVE POSITION Control-lever position

ol-lever position Degree: -2

Speed rpm: 650

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm: 700 Aneroid pressure h: 1200

Del.quantity : 242.0...244.0

1000 : (239.0...247.0)

Spread cm3 : 5.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed : 650 mqn Rack travel in mm: 20.0

Testina:

1st rack travel in: 14.00

rpm : 1045...1060 Speed

2nd rack travel in: 4.00

: 1090...1120 Speed rpm

4th rack travel in: 1350

Speed rpm : 0.00...1.00

LOW IDLE 1

Setting point w/out bumper spring

: 300 Speed rpm Rack travel in mm: 5.0

Testing:

: 100 Speed תכיח Minimum rack trave: 6.50 Speed : 300 **TOT** 

Rack travel in mm : 4.90...5.10

Rack travel in mm: 2.00 Speed : 360...400 יחכרה

TORQUE CONTROL

Dimension a mm : 0.20

Torque control curve - 1st version 1st speed rpm : 1000

Rack travel in m: 15.00...15.10

2nd speed rpm : 700

Rack travel in m: 15.50...15.70

Aneroid/Altitude Compensation Test

1st version

Setting

Speed : 500 שכירו Pressure hPa : 1200

Rack travel mm : 15.00...15.10

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 11.70...11.90

2nd pressure hPa : 110

Rack travel in m: 12.00...12.10

3rd pressure hPa : 470

Rack travel in m: 13.70...14.10

START CUT-OUT

1/min: 220 (240) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200 : 1000 Speed rpm

Del.quantity cm3/: 241.0...247.0 1000 s: (238.0...250.0)

Aneroid pressure h: -

Speed rpm : 500 Del.quantity cm3/: (34.0...136.0 1000 s: (131.0...139.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 14.00

Speed rpm : 1045...1060

STARTING FUEL DELIVERY

Speed rpm

Del.guantity cm3/: 210.0...230.0

1000 s: (206.0...234.0)

LOW IDLE

Speed rpm

Rack travel in mm : 4.80...5.20

Del.quantity cm3/: 17.0...23.0

1000 s: (14.0...26.0) cm3 : 8.00

1000 s: (12.00)

Remarks:

Spread

: MAN-NR. 3-7050X

Setting and blocking of pointer of start-of-delivery sensor on syl. 6

start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS : 2.80...2.90 : (2.75...2.95) Prestroke mm Note remarks Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4 Test sheet : RVI 9,8 a 6 Edition : 21.09.92 Replaces : 02.92 Test oil : ISO-4113 Phasing : 0-60-120-180-240-300 Combination no. : 0 402 046 313 Tolerance + - \* : 0.50 (0.75) Injection pump BASIC SETTING Pump designation : PES6P120A320RS419 : 0 412 026 037 EP type number 1st speed rpm : 1050Governor Governor design. : RQV275...1050PA495-8 Rack travel in mm : 10.40...10.50 : 0 421 813 482 Governer no. Del.quantity cm3/: 18.0...18.2 Customer-spec. information Customer : RVI 100 s: (17.7...18.5) Engine : MIDSO62045 Spread cm3 : 0.51st version kW : 169.0 100 s: (0.9) Rated speed : 2100 rpm : 275.0 2nd speed Rack travel in mm: 5.2...5.4 Del.quantity cm3/: 2.3...2.7 TEST BENCH REQUIREMENTS Test oil 100 s: (2.0...3.0) inlet temp. °C : 38...42 Spread cm3 : 0.8100 s: (1.2) Overflow valve : 1 419 992 118 (B) Setting of injection pump with governor Inlet press., bar: 1.50 GUIDE SLEEVE TRAVEL Test nozzle holder 1st speed rpm : 250 : 1 688 901 105 assembly travel mm : 1.00...1.20 2nd speed ממח : 450 Opening travel mm : 3.30...3.80 : 207...210 pressure, bar 3rd speed : 800 **CDW** travel mm : 5.70...6.00 Orifice plate 4th speed 1050 rom diameter mm : 0,8 travel mm : 7.60...7.80 GUIDE SLEEVE POSITION Test lines : 1 680 750 089 Control-lever position Degree: -1 Outside diameter rpm : 1130 Speed x Wall thickness Rack travel in mm: 15.20...17.80 x Length mm : 8.00x2.50x600 FULL LOAD DELIV. AT FULL LOAD STOP (A) Injection pump setting values Insp. values in parentheses 1st version Set equal delivery quant. Speed rpm : 1050 per values \_\_\_\_ Aneroid pressure h: 700 Del.quantity : 180.5...182.5 1000 : (177.5...185.5) BEGINNING OF DELIVERY Test pressure, bar: 25...27 : 5.00 Spread cm3

1000 : (9.00)

RATED SPEED

1st version

Control Lever

position degrees: 62...70

Testina:

1st rack travel in: 9.40

rpm : 1125...1135 Speed

2nd rack travel in: 4.10

Speed rpm: 1200...1230 4th rack travel in: 1350

rpm : 0.00...1.00 Speed

LOW IDLE 1

Control lever

position degrees: 8...16

Testing:

Speed rpm : 200

Minimum rack trave: 6.60

rpm : 275 Rack travel in mm : 5.20...5.40

CONSTANT REGULATION

Speed rpm : 275...390

Aneroid/Altitude Compensator Test

1st version

Setting

Speed man : 500 hPa : 700 Pressure

: 10.40...10.50 Rack travel mm

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 8.20...8.60

2nd pressure hPa : 360

Rack travel in m: 9.90...10.00

3rd pressure hPa : 160

Rack travel in m: 8.70...9.00

START CUT-OUT

Speed 1/min: 195 (215)

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 650 Del.quantity cm3/ : 184.0...189.0 1000 s: (181.0...191.0)

Aneroid pressure h: -

Speed rpm : 500 Del.quantity cm3/ : 112.5...114.5

1000 s: (109.5...117.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.40

rpm : 1125...1135 Speed

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 151.0...171.0 1000 s: (147.0...175.0)

LOW IDLE

Speed rpm : 275

Rack travel in mm : 5.20...5.40

Del.quantity cm3/: 23.5...27.5

1000 s: (20.5...30.5) cm3 : 8.00Spread

1000 s: (12.00)

Remarks:

Start-of-delivery mark 9.5° cam angle

after start of delivery cyl. 1

**APPLICATION** 

**Omnibus** 

D18

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : UNI 8,1 a 1 Edition : 22.05.92 : 11.91 Replaces Test oil : ISO-4113

Combination no. : 0 402 046 346

Injection pump

Pump designation : PES6P110A720RS530 EP type number : 0 412 016 075

Governor

Governor design. : RQV450...1000PA1016-

: 0 421 813 967 Governer no.

Customer-spec. information Customer : IVECO-UNIC

: 8365.25.532 Engine

TEST BENCH REQUIREMENTS

Test oil

inlet temp. 'C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening |

: 172...175 pressure, bar

Test lines : 1 680 750 015

Outside diameter x Wall thickness

x Length mm : 6.00x1.50x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10 : (1.95...2.15)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 700

Rack travel in mm : 9.80...9.90

Del.quantity cm3/: 11.6...11.8

100 s: (11.4...12.1)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 450.0Rack travel in mm : 5.4...5.8 Del.quantity cm3/ : 1.7...2.2 100 s: (1.4...2.4)

Spread cm3 : 0.4100 s: (0.7)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1095 travel mm : 6.70...6.90

2nd speed : 450 non : 0.70...1.10 travel mm

3rd speed : 700 rpm

: 3.30...3.90 travel mm

4th speed : 850 man

: 4.80...5.20 travel mm

5th speed : 1650 rom

travel mm : 11.00...12.00

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1430

Rack travel in mm : 8.50...11.10

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700 Aneroid pressure h: 700

: 116.5...118.5 Del.quantity 1000 : (114.0...121.0)

Spread cm3 : 4.00

1000 : (7.50)

### RATED SPEED

1st version Control lever

position degrees: 96...106

Testing:

1st rack travel in: 8.80

rpm : 1090...1100 Speed

2nd rack travel in: 4.00

rpm : 1195...1225 Speed

4th rack travel in: 1400

rpm : 0.00...1.00Speed

LOW IDLE 1

Control Lever

position degrees: 66...74

Testina:

Speed nom Minimum rack trave: 7.70

Speed rpm : 450

Rack travel in mm : 5.50...5.70

Rack travel in mm: 2.00

Speed rom : 510...570

Aneroid/Altitude Compensator Test

1st version

Setting

: 500 Speed man hPa : 700 Pressure

Rack travel mm : 9.80...9.90

Measurement

1/min : 500 Speed

1st pressure hPa : -

Rack travel in m: 9.10...9.30

2nd pressure hPa : 400

Rack travel in m: 9.60...9.70

3rd pressure hPa : 380

Rack travel in m: 9.30...9.50

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700

rpm : 1050

Del.quantity cm3/: 113.0...117.0

1000 s: (110.0...120.0)

Aneroid pressure h: -

rpm : 500 Speed

Del.quantity cm3/: 97.0...99.0 1000 s: (94.5...101.5)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 8.80

Speed rpm : 1090...1100

STARTING FUEL DELIVERY

rpm : 100

Del.quantity cm3/: 195.0...225.0

1000 s: (191.0...229.0)

Remarks:

Check electrically unlatched starting fuel delivery (EES) with 24 volt.

On activation of the starting solenoid, the start position must be reached.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : UNI 8,1 a 3 Edition : 22.01.92 : 12.91 Replaces Test oil : ISO-4113

Combination no. : 0 402 046 347

Injection pump

Pump designation : PES6P110A720RS530 EP type number : 0 412 016 075

Governor

Governor design. : RQV450...1075PA1016

Governer no. : 0 421 813 968

Customer-spec. information Customer : IVECO-UNIC

: 8365.25.584 Engine

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

**Opening** 

: 172...175 pressure, bar

Test lines : 1 680 750 015

Outside diameter

x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10 : (1.95...2.15)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rom : 1075

Rack travel in mm : 10.80...10.90

Del.quantity cm3/: 12.2...12.4

100 s: (11.9...12.6)

Spread cm3 : 0.4

100 s: (0.7)

rpm : 450.0 2nd speed Rack travel in mm: 6.0...6.4 Del.quantity cm3/: 1.7...2.2 100 s: (1.4...2.4)

Spread cm3 : 0.4

100 s: (0.7)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 1135 1st speed travel mm

: 7.00...7.20 rpm : 450 2nd speed

: 0.70...1.10 travel mm 3rd speed rpm : 700

: 3.30...3.90 travel mm

: 950 4th speed rom

: 5.60...6.00 travel mm

: 1650 rpm 5th speed

: 11.00...12.00 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1430 Speed

Rack travel in mm : 8.50...11.10

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1075 Speed

Aneroid pressure h: 700 Del.quantity : 122.0...124.0

: (119.5...126.5) 1000

: 4.00 Spread cm3 1000 : (7.50)

#### RATED SPEED

1st version Control Lever

position degrees: 96...104

Testina:

1st rack travel in: 9.80

rpm : 1130...1140 Speed

2nd rack travel in: 4.00

rpm : 1240...1270 Speed

4th rack travel in: 1450

rom : 0.00...1.00Speed

LOW IDLE 1 Control lever

position degrees: 68...76

Testing:

man Speed : 350 Minimum rack trave: 9.00

rpm : 450 Speed

Rack travel in mm : 6.10...6.30

Rack travel in mm: 2.00

Speed rpm : 490...550

Aneroid/Altitude Compensator Test

1st version

Setting

Speed : 500 man Pressure hPa : 700

: 10.80...10.90 Rack travel mm

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 9.40...9.60

2nd pressure hPa : 480

Rack travel in m: 10.40...10.50

3rd pressure hPa : 440

Rack travel in m: 9.90...10.10

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700

Speed rpm : 700

Del.quantity cm3/: 126.0...130.0 1000 s: (123.0...133.0)

Aneroid pressure h: -

rpm : 500 Speed

Del.quantity cm3/: 93.0...95.0

1000 s: (90.5...97.5)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 9.80

rpm : 1130...1140 Speed

STARTING FUEL DELIVERY

rpm : 100

Del.quantity cm3/: 185.0...215.0 1000 s: (181.0...219.0)

Remarks:

Check electrically unlabeled starting fuel delivery (EES) with 24 volt.

On activation of the starting solenoid, the start position must be reached.

## BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : UNI 8,3 a 4 Edition : 25.09.92 Replaces : 11.91

Test oil : ISO-4113

Combination no. : 0 402 046 348

Injection pump

Pump designation : PES6P110A720RS530 EP type number : 0 412 016 075

Governor

: RQV450...1100PA1016 Governor design.

Governer no. : 0 421 813 969

Customer-spec. information Customer : IVECO-UNIC

: 8365.25.533 Engine

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

Opening

pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter x Wall thickness

x Length min : 6.00x1.50x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 2.00...2.10 : (1.95...2.15) Prestroke mm

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6Phasing : 0-60-120-180-240-300

Tolerance + - °  $\pm 0.50 (0.75)$ 

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 700

Rack travel in mm : 11.10...11.20

Del.quantity cm3/: 13.8...14.0

100 s: (13.5...14.2)

Spread cm3 : 0.4

100 s: (0.7)

rpm : 450.0 2nd speed Rack travel in mm: 5.9...6.6

Del.quantity cm3/ : 1.7...2.2 100 s: (1.4...2.4)

Spread cm3 : 0.4100 s: (0.7)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 1145 1st speed

6.80...7.00 travel mm 450 2nd speed man

travel mm

: 1.20...1.60

3rd speed rpm : 700

travel mm : 3.30...3.90

4th speed : 950 CDM

: 5.50...5.90 travel mm

5th speed rpm : 1650

travel mm : 11.00...12.00

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1460

Rack travel in mm : 8.80...11.40

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700 Aneroid pressure h: 700

Del.quantity : 138.0...140.0 1000 : (135.5...142.5)

Spread : 4.00 cm3

: (7.50) 1000

#### RATED SPEED

1st version

Control lever

position degrees: 96...104

Testina:

1st rack travel in: 10.10

rpm : 1140...1150 Speed

2nd rack travel in: 4.00

rpm : 1260...1290 Speed

4th rack travel in: 1450

rpm : 0.00...1.00Speed

LOW IDLE 1

Control Lever

position degrees: 66...74

Testing:

Speed COM Minimum rack trave: 9.60

rpm Speed : 450

Rack travel in mm : 6.00...6.20

CONSTANT REGULATION

rpm : 470...550 Speed

Aneroid/Altitude Compensator Test

1st version

Setting

Speed : 500 rpm hPa : 700 Pressure

: 11.10...11.20 Rack travel mm

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 10.10...10.30

2nd pressure hPa : 480

Rack travel in m: 10.80...10.90

3rd pressure hPa : 440

Rack travei in m: 10.30...10.50

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700

rpm : 1100 Speed

Del.quantity cm3/: 133.0...137.0 1000 s: (130.0...140.0)

Aneroid pressure h: -

: 500 Speed rpm

Del.quantity cm3/: 111.0...113.0

1000 s: (108.5...115.5)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 10.10

rem : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 185.0...215.0 1000 s: (181.0...219.0)

Remarks:

Check electrically unlatched starting

fuel delivery (EES) with 24 volt.

On activation of the starting solenoid. the start position must be reached.

BOSCH INJ. PUMP TEST SPECIFICATIONS Prestroke mm : 4.30...4.40 : (4.25...4.45) Rack travel in mm : 9.00...12.00 Note remarks Firing order : 6-2-4-1-5-3 Test sheet : MB Edition : 21.09.92 Replaces Test oil : ISO-4113 Phasing : 0-60-120-180-240-300 Combination no. : 0 402 046 807A Tolerance + - ° : 0.50 (0.75) Injection pump Time to cyl. no. : 6 Pump designation : PES6P110A820LS3131 EP type number : 0 412 016 715 BASIC SETTING Governor Governor design. : RQV300...1100PA916 1st speed rpm : 1100 Governer no. : 0 421 813 748 Rack travel in mm : 11.40...11.50 Customer-spec, information Customer : MERCEDES-BENZ Del.quantity cm3/ : 13.7...13.9 Engine : 0M447C 100 s: (13.4...14.1) 1st version kW : 177.0 Spread cm3 : 0.4Rated speed : 2200 100 s: (0.8) TEST BENCH REQUIREMENTS 2nd speed rpm : 300.0 Rack travel in mm : 7.6...7.8 Test oil inlet temp. "C : 38...42 Del.quantity cm3/: 1.4...2.0 100 s: (1.1...2.3) Overflow valve Spread cm3 : 0.4: 1 417 413 025 100 s: (0.8) Inlet press., bar: 1.50 (B) Setting of injection pump with governor Overflow quantity min. 1/h: 100...120 GUIDE SLEEVE TRAVEL 1st speed rpm : 300 Test nozzle holder travel mm : 1.10...1.40 assembly : 0 681 343 009 2nd speed : 450 rpm : 3.40...3.80 : 1150 travel mm Opening 3rd speed COM pressure, bar : 172...175 travel mm : 7.90...8.30 4th speed : 1225 rpm travel mm : 9.10...9.70 Test lines : 1 680 750 089 GUIDE SLEEVE POSITION Outside diameter Control-lever position x Wall thickness Degree: -1 rpm : 1140 x Length mm : 8.00x2.50x600 Speed Rack travel in mm : 15.20...17.80 (A) Injection pump setting values Insp. values in parentheses FULL LOAD DELIV. AT FULL LOAD STOP Set equal delivery quant. per values 1st version Speed rpm : 1100

Del.quantity

: 137.0...139.0

1000 : (134.5...141.5)

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Spread cm3: 4.00 1000 : (8.00) RATED SPEED 1st version Control Lever position degrees: 114...122 Testing: 1st rack travel in: 10.40 Speed rpm : 1140...1150 2nd rack travel in: 4.00 rpm : 1195...1225 Speed 4th rack travel in: 1300 rpm : 0.00...1.00Speed LOW IDLE 1 Control Lever position degrees: 85...93 Testina: Speed : 200 nom Minimum rack trave: 9.20 : 300 Speed rom Rack travel in mm : 7.60...7.80 CONSTANT REGULATION rpm : 300...500 Speed START CUT-OUT 1/min: 220 (240) Speed FUEL DELIVERY CHARACTERISTICS 1st version : 600 Speed rpm Del.quantity cm3/: 113.0...116.0 1000 s: (110.0...119.0) Spread cm3 : 5.001000 s: (9.00) BREAKAWAY 1st version 1mm rack travel less than

Remarks:

056

Speed

Speed

full load rack tr: 10.40

rpm Del.quantity cm3/: 130.0...150.0

STARTING FUEL DELIVERY

rpm : 1140...1150

: 100

1000 s: (126.0...154.0)

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : IHC

: 21.09.92 Edition

Replaces

Test oil : ISO-4113

Combination no. : 0 402 046 837

Injection pump

Pump designation : PES6P100A320RS3304

EP type number : 0 412 006 702

Governor

Governor design. : RQV350...1200PA1037K

: 0 421 815 312 Governer no.

Customer-spec. information : NAVISTAR Customer

: DTA-466 Engine

1st version kill : 210.0 : 2400 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 2 417 413 038

Inlet press., bar : 2.50

Overflow

quantity min. 1/h: 240...260

Test nozzle holder

: 1 688 901 101 assembly

Opening |

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 3.35...3.45

: (3.30...3.50)

Rack travel in mm : 9.00...12.00 : 1-5-3-6-2-4 Firing order

Phasing : 0-60-120-180-240-300

Tolerance  $+ - ^{\circ} : 0.50 (0.75)$ 

Time to cyl. no. : 1

BASIC SETTING

1st speed rom : 1200

Rack travel in mm : 13.50...13.60

Del.quantity cm3/: 14.8...15.0

100 s: (14.6...15.2)

Spread cm3 : 0.4

100 s: (0.6)

rpm : 350.02nd speed

Rack travel in mm: 6.0...6.2 Del.quantity cm3/: 2.1...2.5

100 s: (1.8...2.7)

cm3 : 0.6Spread

100 s: (0.8)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 350 1st speed

travel mm : 1.40...1.60

rpm : 500 2nd speed

travel mm : 3.20...3.60

3rd speed rpm : 800

travel mm : 5.60...6.00

4th speed rpm : 1265

travel mm : 8.70...8.90

5th speed : 1460 rpm

travel mm : 10.40...10.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1200

Aneroid pressure h: 900

Del.quantity : 148.0...152.0)

Spread cm3: 4.00

1000 : (6.50)

RATED SPEED

1st version Control Lever

position degrees: 61...69

Testing:

1st rack travel in: 12.50

rpm : 1240...1270 Speed

2nd rack travel in: 4.00

Speed rpm : 1430...1440

4th rack travel in: 1550

nom : 0.06...1.00 Speed

LOW IDLE 1 Control lever

position degrees: 18...26

Testing:

Speed mom : 275 Minimum rack trave: 7.20 : 350 rom

Rack travel in mm: 6.00...6.20

CONSTANT REGULATION

Speed rpm : 325...520

TORQUE CONTROL

Dimension a mm : ?

Torque control curve - 1st version

1st speed rpm : 1200

Rack travel in m: 13.50...13.60

2nd speed rpm : 800

Rack travel in m: 13.40...13.60

3rd speed rpm : 650

Rack travel in m: 12.80...13.20

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rpm : 800 Pressure hPa : 900

: 13.40...13.60 Rack travel mm

Measurement

1/min: 800 Speed

1st pressure hPa : -

Rack travel in m: 8.20...8.60

2nd pressure hPa : 240

Rack travel in m: 9.60...9.70

3rd pressure hPa : 455

Rack travel in m: 12.10...12.50

START CUT-OUT

Speed 1/min : 290 (300)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: rpm : 500 Speed

Del.quantity cm3/ : 74.0...78.0

1000 s: (72.0...80.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.50

Speed rpm : 1240...1270

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/: 115.0...155.0

1000 s: (110.0...160.0)

Rack travel in mm : 20.00...21.00

LOW IDLE

rpm : 350 Speed

Rack travel in mm: 6.00...6.20

Del.quantity cm3/: 21.0...25.0

1000 s: (18.5...27.5)

Spread cm3 : 6.00

1000 s: (8.00)

Remarks:

: NAVISTAR #1818499091

Limit shutoff stop screw to 1.0 mm.

Bow dimension:

Sliding-sleeve position = 37.0 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : PER Edition : 21.09.92 Replaces Test oil : ISO-4113 Combination no. : 0 402 046 840 Injection pump Pump designation : PES6P120A320RS3307 EP type number : 0 412 026 757 Governor Governor design. : RQV250...950PA794-3 : 0 421 814 015 Governer no. Customer-spec. information Customer : PERKINS Engine : EAGLE TX 300/335 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder assembly : 1 688 901 019 **Opening** : 207...210 pressure, bar Orifice plate diameter mm : 0,8 Test lines : 1 680 750 067 Outside diameter x Wall thickness x Length mm : 6.00X1.50X1000 (A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant. per values BEGINNING OF DELIVERY Test pressure, bar: 25...27 Prestroke mm : 3.50...3.60 : (3.45...3.65) Rack travel in mm: 12.00...13.00

Firing order : 1-4-2-6-3-5 Phasing : 0-60-120-180-240-300 Tolerance + - ° : 0.50 (0.75) Time to cyl. no. BASIC SETTING 1st speed rpm: 900 Rack travel in mm : 14.60...14.70 Del.quantity cm3/: 22.3...22.5 100 s: (22.0...22.8) Spread cm3 : 0.6100 s: (0.9) 2nd speed rpm : 250.0Rack travel in mm : 5.9...6.1 Del.quantity cm3/: 1.3...1.7 100 s: (1.0...2.0) cm3 : 0.3Spread 100 s: (0.6) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL 1st speed rpm : 250 travel mm : 0.90...1.40 2nd speed rpm : 350 travel mm : 2.00...2.50 3rd speed : 660 LDW : 3.70...4.20 travel mm : 985 4th speed rpm travel mm : 7.40...7.60 5th speed : 1260 rpm travel mm : 11.00...12.00 GUIDE SLEEVE POSITION Control-lever position Degree: -1 rpm : 1110 Rack travel in mm : 10.00...12.60 FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 900 Aneroid pressure h: 1200 Del.quantity : 223.0...228.0)

Spread

cm3 : 6.00

1000 : (9.00)

RATED SPEED

1st version

Control lever

position degrees: 113...121

Testina:

1st rack travel in: 11.30

rpm : 980...990 Speed

2nd rack travel in: 4.00

rpm : 1055...1085 Speed

4th rack travel in: 1200

rpm : 0.00...1.00 Speed

LOW IDLE 1

Control lever

position degrees: 78...86

Testing:

Speed rpm : 150

Minimum rack trave: 6.50

Speed rpm : 250 Rack travel in mm : 5.90...6.10

CONSTANT REGULATION

rpm : 250...450 Speed

Aneroid/Altitude Compensator Test

1st version

Setting

Speed rom : 600

hPa : 1200 Pressure

Rack travel mm : 12.20...12.30

Measurement

1/min: 600 Speed

1st pressure hPa : -

Rack travel in m: 9.10...9.30

2nd pressure hPa : 340

Rack travel in m: 11.50...11.60 3rd pressure hPa : 220

Rack travel in m: 9.90...10.10

START CUT-OUT

1/min: 170 (190) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

Speed

rpm : 600

Del.quantity cm3/: 134.0...136.0 1000 s: (131.0...139.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.30

rpm : 980...990 Speed

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 130.0...170.0

1000 s: (126.0...174.0)

Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 250 Rack travel in mm : 5.90...6.10

Remarks:

Delivery-valve spring pre-tension

3.2...3.4 mm.

Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring preload on new delivery-valve holders to 2.9...3.1 mm.

E02

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DEE

Edition : 21.09.92 Replaces : 04.92

Test oil : U4.92

Combination no. : 9 402 076 745

Injection pump

Pump designation : PES6P120A720RS3203

EP type number : 0 412 026 728

Governor

Governor design. : RSV625...1100P2A534

-g

Governer no. : 0 421 833 372

Customer-spec. information

Customer : JOHN DEERE

Engine : 6076 HZ 031

1st version kW : 205.0 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 457 413 010

Inlet press., bar: 1.50

Test nozzle holder

assembly : 1 688 901 101

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0,6

Test Lines : 1 680 750 015

Outside diameter

x Wall thickness

x Length mm : 6.00x3.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 3.55...3.65 : (3.50...3.70)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance  $+ - \circ : 0.50 (0.75)$ 

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1100

Rack travel in mm : 12.80...12.90

Del.quantity cm3/: 17.6...17.8

100 s: (17.4...18.0)

Spread cm3 : 0.4

100 s: (0.6)

2nd speed rpm : 625.0
Rack travel in mm : 5.4...5.6
Del.quantity cm3/ : 2.7...3.1

100 s: (2.5...3.3)

Spread cm3 : 0.6

100 s: (0.8)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3 Speed rpm: 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : 4.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100 Aneroid pressure h: 1200

Del.quantity : 176.5...178.5

1000 : (174.5...180.5)

Spread cm3 : 4.00 1000 : (6.50)

RATED SPEED

1st version

Control lever

position degrees: 42...50

Testing:

1st rack travel in: 11.80

Speed rpm : 1140...1150

2nd rack travel in: 4.00

rom : 1205...1215 Speed

3rd rack travel in: 4.00

rpm : 1195...1225 Speed

4th rack travel in: 1350

rpm : 0.30...1.40 Speed

LOW IDLE 1 Control lever

position degrees: 22...30

Setting point w/out bumper spring

rpm : 625 Rack travel in mm: 5.0

Testing:

Speed rpm : 100

Minimum rack trave: 19.00

rpm : 625

Rack travel in mm : 5.40...5.60

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1100

Rack travel in m: 12.80...12.90

2nd speed rpm : 700

Rack travel in m: 13.40...13.60

Aneroid/Altitude Compensator Test

1st version

Setting

Speed חכר : 500 hPa : 1200 Pressure

: 13.40...13.60 Rack travel mm

Measurement

Speed 1/min: 500

1st pressure hPa : -

Rack travel in m: 11.60...11.80

2nd pressure hPa : 645

Rack travel in m: 12.10...12.20

3rd pressure hPa : 840

Rack travel in m: 12.90...13.30

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200

Speed rpm : 700

Del.quantity cm3/: 189.0...193.0 1000 s: (187.0...195.0)

Aneroid pressure h: -

Speed rpm Del.quantity cm3/: 143.0...147.0

1000 s: (141.0...149.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 11.80

Speed rpm : 1140...1150

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quantity cm3/: 90.0...110.0 1000 s: (85.0...115.0)

Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 625

Rack travel in mm : 5.40...5.60

Del.quantity cm3/: 27.0...31.0

1000 s: (25.0...33.0) cm3 : 6.00 Spread

1000 s: (8.00)

Remarks:

: JOHN DEERE # RE47399

Adjustment without torque-control spring retainer with 0,5 mm less control-rod travel. Increase in full-load delivery with torque-control spring retainer.

Starting/full-load transition speed from holding magnet = 450 1/min.

Start-of-delivery mark at 10° cam rotation angle after start of delivery, cylinder 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DEE

Edition : 21.09.92

Replaces :

Test oil : ISO-4113

Combination no. : 0 402 076 747

Injection pump

Pump designation : PES6P110A720RS3224-1

EP type number : 0 412 016 739

Governor

Governor design. : RSV475...1100P2A534

-11

Governer no. : 0 421 833 377

Customer-spec. information

Customer : JOHN DEERE

Engine : 6101 AT 001

1st version kW : 170.0 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 457 413 010

Inlet press., bar: 1.50

Test nozzle holder

assembly : 1 688 901 101

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0,6

Test Lines : 1 680 750 015

Outside diameter

x Wall thickness

x Length mm : 6.00x3.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 2.95...3.05

: (2.90...3.10) Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance  $+ - ^{\circ} : 0.50 (0.75)$ 

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1100

Rack travel in mm : 13.30...13.40

Del.quantity cm3/: 16.2...16.4

100 s: (16.0...16.6)

Spread cm3: 0.4

100 s: (0.6)

2nd speed rpm: 475.0

Rack travel in mm : 5.6...5.8 Del.quantity cm3/ : 1.0...1.4

100 s: (0.7...1.6)

Spread cm3:0.6

100 s: (0.8)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3 Speed rpm: 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : 4.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100 Aneroid pressure h: 600

Del.guantity : 162.0...164.0

1000 : (160.0...166.0)

Spread cm3 : 4.00

1000 : (6.50)

RATED SPEED

1st version

Control Lever

position degrees: 40...48

Testina: 1st rack travel in: 12.30 rpm : 1145...1155 Speed 2nd rack travel in: 4.00 rpm : 1200...1210 Speed 3rd rack travel in: 4.00 rpm : 1195...1225 Speed 4th rack travel in: 1350 Speed rpm : 0.30...1.40 LOW IDLE 1 Control lever position degrees: 16...24 Setting point w/out bumper spring mpm : 475 Rack travel in mm: 5.2 Testina: Speed rpm : 100 Minimum rack trave: 19.00 Speed rpm : 475 Rack travel in mm : 5.60...5.80 TORQUE CONTROL Torque control curve - 1st version rpm : 1100 1st speed Rack travel in m: 13.30...13.40 2nd speed rpm : 600 Rack travel in m: 14.10...14.30 Aneroid/Altitude Compensator Test 1st version Settina Speed : 500 COM Pressure hPa : 600 : 14.10...14.30 Rack travel mm Measurement Speed 1/min: 500 1st pressure hPa : -Rack travel in m: 11.90...12.10 2nd pressure hPa : 265 Rack travel in m: 13.30...13.40 3rd pressure hpa : 135 Rack travel in m: 12.30...12.70 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 600 rpm : 600

Del.quantity cm3/: 177.0...181.0

Aneroid pressure h: -

MCM

1000 s: (175.0...183.0)

: 500

Del.quantity cm3/: 130.5...134.5 1000 s: (128.5...136.5) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 12.30 rum : 1145...1155 Speed STARTING FUEL DELIVERY Speed r pan : 100 Del.quantity cm3/: 125.0...145.0 1000 s: (120.0...150.0) Rack travel in mm: 19.00...21.00 LOW IDLE rpm : 475 Speed Rack travel in mm : 5.60...5.80 Del.quantity cm3/: 10.0...14.0 1000 s: (7.5...16.5) Spread cm3 : 6.001000 s: (8.00) Remarks: : JOHN DEERE # RE51966 Starting/full-load transition speed from holding magnet = 450 1/min. Start-of-delivery mark 10.5° cam angle after start of delivery cyl. 1 Adjustment without torque-control spring retainer with 0,5 mm less control-rod travel. Increase in full-load delivery with torque-control spring retainer. APPLICATION Wheel loader

Speed

BOSCH INJ. PUMP TEST SPECIFICATIONS Prestroke mm : 3.50...3.60 : (3.45...3.65) Rack travel in mm : 9.00...12.00 Note remarks Firing order : 1-5-3-6-2-4 Test sheet : LIE Edition : 21.08.92 Replaces Test oil : ISO-4113 Phasina : 0-60-120-180-240-300 Combination no. : 0 402 075 748A Tolerance + - ° : 0.50 (0.75) Injection pump Time to cyl. no. : 1 Pump designation : PES6P110A720RS3305 EP type number : 0 412 016 740 BASIC SETTING Governor Governor design. : RSV300...1100P1A555 rpm: 1000 1st speed Governer no. : 0 421 833 379 Rack travel in mm : 15.30...15.40 Cust. part no. : 9271056 Del.quantity cm3/: 18.3...18.5 Customer-spec. information Customer : LIEBHERR 100 s: (18.0...18.7) Engine : D 926 TI Spread cm3 : 0.41st version kW : 210.0 100 s: (0.7) : 2200 Rated speed 2nd speed rpm : 400.0TEST BENCH REGUIREMENTS Rack travel in mm: 7.3...7.5 Del.quantity cm3/: 1.0...1.6 Test oil 100 s: (0.7...1.8) inlet temp. °C : 38...42 Spread cm3 : 0.4100 s: (0.7) Overflow valve : 1 417 413 025 GUIDE SLEEVE POSITION Control-lever position Inlet press., bar: 1.50 Degree: -3 rpm : 800 Speed Test nozzle holder Rack travel in mm : 0.30...0.70 assembly : 0 681 343 009 Governor spring pre-tension Opening Click setting x : ? : 172...175 pressure, bar FULL LOAD DELIV. AT FULL LOAD STOP Test lines : 1 680 750 089 1st version Speed rpm : 1000 Outside diameter Aneroid pressure h: 1300 x Wall thickness : 183.0...185.0 Del.quantity 1000 : (180.5...187.5) x Lenath mm : 8.00x2.50x600 Spread cm3 : 4.00 (A) Injection pump setting values 1000 : (7.50) Insp. values in parentheses Set equal delivery quant. RATED SPEED per values 1st version BEGINNING OF DELIVERY Control lever Test pressure, bar: 25...27 position degrees: 96...104

Testing:

1st rack travel in: 14.30 Speed rpm : 1040...1050 2nd rack travel in: 4.00 rpm : 1080...1110 Speed 3rd rack travel in: 4.00 : 1115...1145 Speed L/Dill 4th rack travel in: 1260 rom : 0.30...1.40Speed LOW IDLE 1 Control lever position degrees: 69...77 Setting point w/out bumper spring : 400 rpm Rack travel in mm: 6.9 Speed rpm : 400 Rack travel in mm : 7.30...7.50 Rack travel in mm : 2.00 Speed rpm : 560...620 TORQUE CONTROL Torque control curve - 1st version 1st speed riom : 1000 Rack travel in m: 15.30...15.40 2nd speed rpm : 500 Rack travel in m: 15.30...15.50 Aneroid/Altitude Compensator Test ist version Setting Speed : 550 man. hPa : 1300 Pressure Rack travel mm : 15.30...15.40 Measurement 1/min : 550 Speed 1st pressure hPa : -Rack travel in m: 13.40...13.60 2nd pressure hPa : 510 Rack travel in m: 13.70...13.80 3rd pressure hPa : 640 Rack travel in m: 14.90...15.10 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: -Speed rpm : 550 Del.quantity cm3/: 149.0...151.0 1000 s: (146.5...153.5) BREAKAWAY

1mm rack travel less than full load rack tr: 14.30 Speed rpm : 1040...1050 STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/ : 145.0...165.0 1000 s: (141.0...169.0) Rack travel in mm : 20.00...21.00 LOW IDLE Speed rpm : 400 Rack travel in mm : 7.30...7.50 Del.quantity cm3/: 10.0...16.0 1000 s: (7.5...18.5) Spread cm3 : 4.501000 s: (7.50) Remarks: :

1st version

**E08** 

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : LIE Edition : 21.09.92 Replaces Test oil : ISO-4113 Combination no. : 0 402 076 748B Injection pump Pump designation : PES6P110A720RS3305 : 0 412 016 740 EP type number Governor Governor design. : RSV300...1100P1A555 : 0 421 833 379 Governer no. Cust. part no. : 9273248 Customer-spec. information Customer : LIEBHERR Engine : D 926 TI 1st version kW : 200.0 Rated speed : 2200 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder : 0 681 343 009 assembly Opening pressure, bar : 172...175 Test lines : 1 680 750 089 Outside diameter

x Wall thickness x Length mm : 8.00x2.50x600 (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values BEGINNING OF DELIVERY Test pressure, bar: 25...27 E09

Prestroke mm : 3.50...3.60 : (3.45...3.65) Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4

Phasina : 0-60-120-180-240-300 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 900

Rack travel in mm: 15.00...15.10

Del.quantity cm3/: 17.8...18.0

100 s: (17.5...18.2)

cm3 : 0.4Spread

100 s: (0.7)

rpm : 400.02nd speed Rack travel in mm: 7.3...7.5 Del.quantity cm3/: 1.0...1.6 100 s: (0.7...1.8)

cm3 : 0.4

Spread 100 s: (0.7)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3 rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x :?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

Speed rpm : 900 Aneroid pressure h: 1300

Del.quantity : 1/8.0...182.5)

: 4.00 Spread cm3 1000 : (7.50)

RATED SPEED

1st version Control lever

position degrees: 96...104

Testing:

1st rack travel in: 14.00 rpm : 920...930 Speed 2nd rack travel in: 4.00 Speed : 955...985 rom 3rd rack travel in: 4.00 rom : 985...1005 Speed 4th rack travel in: 1260 Speed rpm : 0.30...1.40 LOW IDLE 1 Control Lever position degrees: 69...77 Setting point w/out bumper spring : 400 rom Rack travel in mm: 6.9 : 400 ripm Rack travel in mm : 7.30...7.50 Rack travel in mm: 2.00 Speed rpm : 560...620 TORQUE CONTROL Torque control curve - 1st version mom : 900 1st speed Rack travel in m: 13.60...13.70 2nd speed rpm : 500 Rack travel in m: 13.60...13.80 Aneroid/Altitude Compensator Test 1st version Settina Speed : 550 rom Pressure hPa : 1300 : 15.00...15.10 Rack travel mm Measurement 1/min: 550 Speed 1st pressure hPa : -Rack travel in m: 13.80...14.00 2nd pressure hPa : 550 Rack travel in m: 14.10...14.20 3rd pressure hPa : 650 Rack travel in m: 14.60...14.80 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: -Speed rpm : 550 Del.quantity cm3/ : 164.0...166.0 1000 s: (161.5...168.5) **BREAKAWAY** 

1st version

E10

1mm rack travel less than full load rack tr: 14.00 rpm : 920...930 Speed STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/ : 145.0...165.0 1000 s: (141.0...169.0) Rack travel in mm : 20.00...21.00 LOW IDLE Speed rpm : 400 Rack travel in mm : 7.30...7.50 Del.quantity cm3/: 10.0...16.0 1000 s: (7.5...18.5) Spread cm3 : 4.501000 s: (7.50) Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : FIA 12,9 c : 21.09.92 Edition Replaces : 02.90 Test oil : ISO-4113 Combination no. : 9 402 636 800 Injection pump Pump designation : PE6P130A720/3LS7827 EP type number : 0 412 636 814 Governor Governor design. : RQV400...1150PA937 Governer no. : 0 421 813 823 Customer-spec. information Customer : IVECO-FIAT : 8262.43.001 Engine TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder : 1 688 901 105 assembly Openina pressure, bar : 207...210 Orifice plate diameter mm : 0,8 Test lines : 1 680 750 015 Outside diameter x Wall thickness x Length mm : 6.00x1.50x600 (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values BEGINNING OF DELIVERY Test pressure, bar: 25...27

> : 5.10...5.20 : (5.05...5.25)

Rack travel in mm : 9.00...12.00

Firing order : 1-6-5-4-3-2 Phasing : 0-75-120-195-240-315 Tolerance + - ° : 0.50 (0.75) Time to cyl. no. : 1 BASIC SETTING 1st speed rpm: 1150 Rack travel in mm : 11.70...11.80 Del.quantity cm3/: 26.8...27.1 100 s: (26.4...27.4) Spread cm3 : 0.6100 s: (1.0) 2nd speed rpm : 400.0Rack travel in mm : 4.8...5.2 Del.quantity cm3/: 2.1...2.7 100 s: (1.7...3.1) Spread cm3 : 1.0100 s: (1.4) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL rpm : 400 1st speed travel mm : 2.60...3.60 2nd speed rpm : 500 : 4.20...4.80 travel mm 3rd speed rpm : 650 : 5.80...6.40 travel mm 4th speed rpm : 900 : 6.70...7.00 travel mm : 1350 5th speed rpm : 11.00...12.00 travel mm GUIDE SLEEVE POSITION Control-lever position Degree: -1 rpm : 850 Rack travel in mm : 16.50...18.50 FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 1150 Aneroid pressure h: 1200 

Prestroke mm

Spread cm3 : 6.00

1000 : (10.00)

RATED SPEED

1st version Control Lever

position degrees: 106...114

Testina:

1st rack travel in: 10.70

rpm : 1190...1200 Speed

2nd rack travel in: 4.00

rpm : 1240...1270 Speed

4th rack travel in: 1350

nom : 0.00...1.00 Speed

LOW IDLE 1

Control lever

position degrees: 63...71

Testina:

rpm : 100 Speed Minimum rack trave: 6.50 Speed rpm : 400

Rack travel in mm : 4.90...5.10

CONSTANT REGULATION

Speed rpm : 400...550

Aneroid/Altitude Compensator Test

1st version

Setting Speed

rpm : 500 Pressure hPa : 1200

Rack travel mm : 11.70...11.80

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 8.50...8.70

2nd pressure hPa : 650

Rack travel in m: 10.70...10.80 3rd pressure hPa : 250

Rack travel in m: 9.20...9.40

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200 Speed rpm : 700
Del.quantity cm3/: 275.0...282.0
1000 s: (271.5...285.5)

Aneroid pressure h: -

Speed : 500 rom

Del.quantity cm3/: 165.0...168.0

1000 s: (161.5...171.5)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 10.70

rpm : 1190...1200 Speed

LOW IDLE

Speed rpm : 400 Rack travel in mm : 4.80...5.20 Del.quantity cm3/ : 21.0...27.0

1000 s: (17.0...31.0)

cm3 : 10.00 Spread

1000 s: (14.00)

Remarks:

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1

start of delivery

APPLICATION

Special-purpose vehicle

E12

BOSCH INJ. PUMP TEST SPECIFICATIONS : 1- 5- 4- 8- 6- 3-7- 2 Firing order Note remarks Test sheet : STE : 21.09.92 Edition Phasing Replaces : 05.92 Test oil : ISO-4113 Tolerance + - ° Combination no. : 0 402 638 807 Injection pump BASIC SETTING Pump designation : PE8P120A120LS7127 EP type number : 0 412 628 817 1st speed Governor Governor design: RQ300/1100PA134-3 : 0 421 801 655 Governer no. Customer-spec. information Customer : SNF Engine : WD 815.72/73 Spread TEST BENCH REQUIREMENTS Test oil 2nd speed inlet temp. \*C : 38...42 Overflow valve : 1 417 413 025 Spread Inlet press., bar: 1.50 Test nozzle holder : 1 688 901 105 assembly Speed Openina pressure, bar : 207...210 Orifice plate diameter mm : 0,8 1st version Speed Test lines : 1 680 750 089 Outside diameter Spread x Wall thickness x Lenath mm : 8.00X2.50X600 RATED SPEED (A) Injection pump setting values Insp. values in parentheses

: 0-45-90-135-180-225-270-315 : 0.50 (0.75) Time to cyl. no. : 1 rom: 1100 Rack travel in mm : 13.80...13.90 Del.quantity cm3/: 20.5...20.7 100 s: (20.2...21.0) cm3 : 0.5100 s: (0.9) rpm : 300.0Rack travel in mm: 6.4...7.0 Del.quantity cm3/: 1.4...2.0 100 s: (1.1...2.3) cm3 : 0.8 100 s: (1.2) GUIDE SLEEVE POSITION Control-lever position Degree: -1 rpm : 660 Rack travel in mm : 15.40...16.60 FULL LOAD DELIV. AT FULL LOAD STOP rpm : 1100 Aneroid pressure h: 1200 Del.quantity : 203.0...210.0) cm3 : 5.00 1000 : (9.00) 1st version Setting point: Speed rpm : 600 Rack travel in mm: 16.0 Testing: 1st rack travel in: 12.80 rpm : 1145...1160 Speed 2nd rack travel in: 4.00

Set equal delivery quant.

Rack travel in mm : 9.00...12.00

: 5.00...5.10

: (4.95...5.15)

per values

BEGINNING OF DELIVERY

Prestroke mm

Test pressure, bar: 25...27

npr : 1230...1260 Speed

4th rack travel in: 1350

Speed rpm : 0.00...1.00

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 300 Rack travel in mm: 6.7

Testing:

: 200 Speed CDU Minimum rack trave: 8.20 Speed rom : 300

Rack travel in mm : 6.60...6.80

Rack travel in mm: 2.00

Speed : 400...440 COM

Aneroid/Altitude Compensator Test

1st version

Settina

Speed : 500 rpm. Pressure hPa : 1200

: 13.80...13.90 Rack travel mm

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 10.10...10.40

2nd pressure hPa : 790

Rack travel in m: 12.80...12.90

3rd pressure hPa : 490

Rack travel in m: 10.70...10.90

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: rpm : 500 Speed

Del.quantity cm3/: 142.0...144.0 1000 s: (139.0...147.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 12.80

rpm : 1145...1160 **Speed** 

STARTING FUEL DELIVERY

Speed : 100 rpm

Del.quantity cm3/: 180.0...210.0

1000 s: (176.0...214.0)

Rack travel in mm : 15.00...16.00

Remarks:

Delivery-valve spring pre-tension

3.2...3.4 mm.

Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring preload on new delivery-valve holders

to 2.9...3.1 mm.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet

: STE : 21.09.92 Edition Replaces : 05.92

Test oil : ISO-4113

Combination no. : 0 402 638 808

Injection pump

Pump designation : PE8P120A120LS7127

EP type number : 0 412 628 817

Governor

Governor design. : RQV250...1100PA785-3

: 0 421 814 004 Governer no.

Customer-spec. information Customer : SNF

Engine : WD 815.72/73

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 105 assembly

Opening |

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 089

Outside diameter

x Wall thickness

x Length mm : 8.00x2.50x600

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10

: (4.95...5.15)

Rack travel in mm : 9.00...12.00

: 1- 5- 4- 8- 6- 3-7- 2 Firing order

Phasing : 0-45-90-135-180-225-

270-315

Tolerance + - \* : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed 1100 : 1100

Rack travel in mm : 13.80...13.90

Del.quantity cm3/: 20.5...20.7

100 s: (20.2...21.0)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 250.0

Rack travel in mm: 6.6...7.2

Del.quantity cm3/: 1.4...2.0 100 s: (1.1...2.3)

cm3 : 0.3 Spread

100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 250 1st speed

: 0.90...1.40 travel mm

rpm : 355 2nd speed

: 1.70...2.20 travel mm

rpm : 410 3rd speed

travel mm : 2.20...2.70 4th speed

rpm : 1150 travel mm

: 8.30...8.70

rpm : 1390 5th speed

: 11.00...12.00 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

Speed rpm : 1220

Rack travel in mm : 11.50...14.10

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 1200

Del.quantity : 205.0...207.0

1000 : (202.0...210.0)

: 5.00 Spread cm3 1000 : (9.00)

RATED SPEED

1st version Control lever

position degrees: 103...111

Testina:

1st rack travel in: 12.80

rom : 1140...1150 Speed

2nd rack travel in: 4.00

rpm : 1250...1280 Speed

4th rack travel in: 1350

Speed rom : 0.00...1.00

LOW IDLE 1 Control Lever

position degrees: 70...78

Testing:

Speed : 150 rpm Minimum rack trave: 8.80 : 250 Speed rpm

Rack travel in mm : 6.80...7.00

CONSTANT REGULATION

Speed rpm : 350...420

Aneroid/Altitude Compensator Test

1st version

Setting

: 500 Speed rpm Pressure hPa : 1200

Rack travel mm : 13.80...13.90

Measurement

Speed  $1/\min : 500$ 

1st pressure hPa : -

Rack travel in m: 10.10...10.40

2nd pressure hPa : 790 Rack travel in m: 12.80...12.90

3rd pressure hPa : 520

Rack travel in m: 10.70...10.90

START CUT-OUT

1/min: 170 (190) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -Speed rpm : 500

E16

Del.quantity cm3/: 142.0...144.0

1000 s: (139.0...147.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.80

Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed : 100 rpm

Del.quantity cm3/: 180.0...210.0

1000 s: (176.0...214.0)

Rack travel in mm : 15.00...16.00

Remarks:

Delivery-valve spring pre-tension

3.2...3.4 mm.

Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring preload on new delivery-valve holders

to 2.9...3.1 mm.

## BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB

Edition : 21.09.92

Replaces : -

Test oil : ISO-4113

Combination no. : 0 402 640 841

Injection pump

Pump designation : PE12P120A320LS7855

EP type number : 0 412 620 835

Governor

Governor design. : RQ400/1065PA1024 Governor no. : 0 421 801 634

Customer-spec. information

Customer : MERCEDES-BENZ

Engine : OM 444 LA

1st version kW : 485.0 Rated speed : 2130

## TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 419 992 198

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 150...170

Test nozzle holder

assembly : 1 688 901 019

Opening.

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter x Wall thickness

x Length mm : 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30

: (5.15...5.35)

Rack travel in mm : 9.00...12.00

Firing order : 12- 1- 5- 9- 8- 3-

4- 11- 10- 2- 6- 7

Phasing : 0-45-60-105-120-165-180-225-240-285-300-

345

Tolerance  $+ - ^{\circ} : 0.50 (0.75)$ 

Time to cyl. no. : 12

BASIC SETTING

1st speed rpm: 1065

Rack travel in mm : 13.90...14.00

Del.quantity cm3/: 21.1...21.3

100 s: (20.8.,.21.6)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 400.0 Rack travel in mm : 4.8...5.4 Del.quantity cm3/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm3 : 0.8

100 s: (1.2)

GUIDE SLEEVE POSITION Control-lever position

Degree: -2

Speed rpm: 600

Rack travel in mm : 14.60...17.20

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1065 Aneroid pressure h: 1000

Del.quantity : 211.0...213.0

1000 : (208.0...216.0)

Spread cm3 : 5.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed LDW Rack travel in mm: 15.9 Testing: 1st rack travel in: 12.90 rpm : 1110...1125 Speed 2nd rack travel in: 4.00 Speed rpm : 1180...1210 4th rack travel in: 1300 Speed rpm : 0.00...1.50 LOW IDLE 1 Setting point w/out bumper spring rpm : 400 Rack travel in mm: 5.1 Testing: Speed rpm Minimum rack trave: 7.20 Speed rpm : 400 Rack travel in mm : 5.00...5.20 Rack travel in mm: 2.00 Speed rpm : 465...505 Ameroid/Altitude Compensator Test 1st version Setting Speed : 500 MOL Pressure hPa : -Rack travel mm : 10.80...11.10 Measurement Speed 1/min: 500 1st pressure hPa : 350 Rack travel in m: 11.50...11.70 2nd pressure hPa : 500 Rack travel in m: 12.80...13.00 START CUT-OUT 1/min: 320 (340) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1000 rpm : 600 Del.quantity cm3/: 205.0...209.0 1000 s: (202.0...212.0) cm3 : 8.00 Spread 1000 s: (12.0) Ameroid pressure h: rpm : 500 Speed Del.quantity cm3/: 144.0...146.0

1000 s: (141.0...149.0)

Spread cm3 : 8.00 1000 s: (12.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 12.90 Speed rpm : 1110...1125

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 210.0...230.0 1000 s: (206.0...234.0)

Remarks:

APPLICATION

Rail can

BOSCH INJ. PUMP TEST SPECIFICATIONS Prestroke mm : 5.00...5.10 : (4.95...5.15) Note remarks Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4 Test sheet : UNI Edition : 05,10.92 Replaces Test oil : ISO-4113 Phasing : 0-60-120-180-240-300 Combination no. : 0 402 646 605 Tolerance + - \* : 0.50 (0.75) Injection pump Time to cyl. no. : 1 Pump designation : PE6P130A720RS7197 EP type number : 0 412 636 815 BASIC SETTING Governor Governor design. : RQV300...1000PA946-2 1st speed rpm: 1000 : 0 421 814 021 Governer no. Rack travel in mm : 11.90...12.00 Customer-spec. information Customer : IVECO-UNIC Del.quantity cm3/: 21.2...21.4 Engine : 8210.22.800 100 s: (20.9...21.7) : 224.0 1st version kW Spread cm3 : 0.5Rated speed : 2000 100 s: (0.8) TEST BENCH REQUIREMENTS rpm : 300.02nd speed Rack travel in mm : 5.0...5.4 Del.quantity cm3/ : 1.9...2.5 Test oil inlet temp. °C : 38...42 100 s: (1.5...2.9) Overflow valve Spread cm3 : 0.8 : 1 417 413 025 100 s: (1.2) Inlet press., bar: 1.50 (B) Setting of injection pump with governor Test nozzle holder assembly : 1 688 901 105 GUIDE SLEEVE TRAVEL 1st speed rpm : 1045Openina travel mm : 207...210 pressure, bar 2nd speed travel mm Orifice plate 3rd speed diameter mm : 0,8 travel mm 4th speed travel mm : 1 680 750 075 Test Lines 5th speed rpm travel mm Outside diameter x Wall thickness

: 8.30...8.50 rpm : 300 : 1.10...1.30 rpm : 400 : 2.30...2.90 rpm : 700 : 4.90...5.50 : 1350 : 11.00...12.00 GUIDE SLEEVE POSITION x Length mm : 8.00x2.50x1000 Control-lever position Degree: -1 (A) Injection pump setting values Speed rpm : 1130 Insp. values in parentheses Rack travel in mm : 9.60...12.20 Set equal delivery quant. per values FULL LOAD DELIV. AT FULL LOAD STOP BEGINNING OF DELIVERY 1st version Test pressure, bar: 25...27 rpm : 1000 Speed Aneroid pressure h: 900

Del.quantity : 212.0...214.0 1000 : (209.0...217.0) : 5.00 Spread cm3 1000 : (8.00) RATED SPEED 1st version Control lever position degrees: 111...119 Testing: 1st rack travel in: 10.90 rpm : 1040...1050 Speed 2nd rack travel in: 4.00 Speed rpm : 1130...1160 4th rack travel in: 1350 rom : 0.00...1.00Speed LOW IDLE 1 Control lever position degrees: 60...68 Testing: Speed : 100 mqn

Minimum rack trave: 6.70 : 300 Speed LDW Rack travel in mm : 5.10...5.30 Rack travel in mm: 2.00

Speed rpm : 390...430

CONSTANT REGULATION : 410...530 Speed mcm

Ameroid/Altitude Compensator Test

1st version Settina Speed : 500 rom Pressure hPa : 900 Rack travel mm

: 11.90...12.00

Measurement 1/min: 500 Speed

1st pressure hPa : -Rack travel in m: 10.10...10.30 2nd pressure hPa : 360 Rack travel in m: 11.50...11.60

3rd pressure hPa : 265

Rack travel in m: 10.50...10.70

FUEL DELIVERY CHARACTERISTICS

1st version Aneroid pressure h: 900 : 550 Speed COM

Del.quantity cm3/: 214.0...220.0 1000 s: (211.0...223.0)

Aneroid pressure h: -

Speed rpm : 500 Del.quantity cm3/ : 161.0...163.0 1000 s: (158.0...166.0)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 10.90 rpm : 1040...1050 Speed

STARTING FUEL DELIVERY

Speed : 100 rom Del.quantity cm3/: 220.0...260.0 1000 s: (216.0...264.0)

LOW IDLE

Speed : 300 rpm

Rack travel in mm: 5.00...5.40 Del.quantity cm3/: 19.0...25.0 1000 s: (15.0...29.0)

Spread cm3 : 8.00 1000 s: (12.00)

Remarks:

Check electrically unlatched starting fuel delivery (EES) with 24 volt.

On activation of the starting solenoid, the start position must be reached.

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

E20

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet

: MB Edition : 21.09.92

Replaces

Test oil : ISO-4113

Combination no. : 0 402 646 796

Injection pump

Pump designation : PE6P12DA32OLS7858 : 0 412 626 875

EP type number Governor

Governor design. : RQ300/1050PA1030-5

Governer no. : 0 421 801 665

Customer-spec, information

Customer : MERCEDES-BENZ

Engine : 0M401 LA

1st version kW : 200.0 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

assembly : 1 688 901 105

Opening |

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter

x Wall thickness

: 8.00x1.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60

: (5.45...5.65)

Rack travel in mm : 20.00...21.00

Firing order : 6-3-5-2-4-1

Phasing : 0-60-120-180-240-300

Tolerance + - " : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rom: 1050

Rack travel in mm : 11.70...11.80

Del.quantity cm3/: 18.9...19.1

100 s: (18.6...19.4)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 300.02nd speed Rack travel in mm : 5.3...5.9 Del.quantity cm3/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm3 : 0.6

100 s: (1.0)

GUIDE SLEEVE POSITION Control-lever position

Degree: -2

Speed rpm: 600 Rack travel in mm: 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050

Aneroid pressure h: 800

Del.quantity : 189.0...191.0

1000 : (186.0...194.0)

: 5.00 Spread cm3

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed : 600 **Lbw** Rack travel in mm: 20.0

Testina: 1st rack travel in: 10.70 rpm : 1090...1105 Speed 2nd rack travel in: 4.00 rpm : 1160...1190 Speed 4th rack travel in: 1300 Speed rom : 0.00...1.50LOW IDLE 1 Setting point w/out bumper spring Speed Rack travel in mm: 5.6 Testina: rpm Speed : 200 Minimum rack trave: 8,40 Speed : 300 rpm Rack travel in mm : 5.50...5.70 Rack travel in mm : 2.00 Speed COM : 370...410 Aneroid/Altitude Compensator Test 1st version Setting Speed rpm : 500 Pressure hPa : -: 9.70...10.00 Rack travel mm Measurement Speed 1/min : 500 1st pressure hPa : 200 Rack travel in m: 10.10...10.20 2nd pressure hPa : 350 Rack travel in m: 10.80...11.00 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 800 Speed : 1050 (DOM) Del.quantity cm3/: 181.0...185.0 1000 s: (178.0...188.0) Spread cm3 : 8.001000 s: (12.0) Aneroid pressure h: -: 500 Speed man Del.quantity cm3/: 126.0...128.0

1000 s: (123.0...131.0)

cm3 : 8.00 1000 s: (12.0) 1st version 1mm rack travel less than

full load rack tr: 10.70 Speed rpm : 1090...1105

:

Remarks:

aliar RS.

BREAKAWAY

Spread

BOSCH INJ. PUMP TEST SPECIFICATIONS BEGINNING OF DELIVERY Test pressure, bar: 25...27 Note remarks Prestroke mm : 5.50...5.60 Test sheet : (5.45...5.65) : MB : 21.09.92 Edition Rack travel in mm : 20.00...21.00 Replaces Firing order : 6-3-5-2-4-1 : ISO-4113 Test oil Combination no. : 0 402 646 797 Phasing : 0-60-120-180-240-300 Injection pump Pump designation : PE6P120A320LS7858 Tolerance + - \* : 0.50 (0.75) EP type number : 0 412 626 875 Governor Time to cyl. no. : 6 Governor design. : RQ300/1050PA1030-4 Governer no. : 0 421 801 664 BASIC SETTING Customer-spec, information 1st speed rum : 1050 Customer : MERCEDES-BENZ Rack travel in mm : 11.10...11.20 Engine : 0M401 LA Del.guantity cm3/: 17.0...17.2 1st version kW : 180.0 Rated speed : 2100 100 s: (16.7...17.5) TEST BENCH REQUIREMENTS Spread cm3 : 0.5Test oil 100 s: (0.9) inlet temp. 'C : 38...42 2nd speed rpm : 300.0Overflow valve Rack travel in mm: 5.3...5.9 : 1 417 413 025 Del.quantity cm3/: 1.6...2.2 100 s: (1.3...2.5) Inlet press., bar: 1.50 cm3 : 0.6Spread 100 s: (1.0) Overflow quantity min. 1/h: 100...120 GUIDE SLEEVE POSITION Control-lever position Test nozzle holder Degree: -2 : 1 688 901 105 assembly rpm : 600 Speed Rack travel in mm : 19.20...20.80 Opening : 207...210 pressure, bar FULL LOAD DELIV. AT FULL LOAD STOP Orifice plate 1st version diameter mm : 0,8 Speed rpm : 1050 Aneroid pressure h: 700 : 170.0...172.0 Del.quantity Test lines : 1 680 750 075 1000 : (167.0...175.0) Spread cm3 : 5.00Outside diameter 1000 : (9.00)

Testing: 1st rack travel in: 10.10 Speed rpm : 1090...1105 2nd rack travel in: 4.00 : 1165...1195 Speed COM 4th rack travel in: 1300 ricm : 0.00...1.50Speed LOW IDLE 1 Setting point w/out bumper spring Speed rpm : 300 Rack travel in mm : 5.6 Testing: Speed rpm : 200 Minimum rack trave: 8.00 rpm : 300 Speed Rack travel in mm: 5.50...5.70 Rack travel in mm: 2.00 Speed rpm: 360...400 Aneroid/Altitude Compensator Test 1st version Setting : 500 Speed rpm Pressure hPa : -: 10.00...10.30 Rack travel mm Measurement 1/min: 500 Speed 1st pressure hPa : 200 Rack travel in m: 10.20...10.30 2nd pressure hPa : 700 Rack travel in m: 11.10...11.20 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 700 : 550 Speed Lbu Del.quantity cm3/: 160.0...164.0 1000 s: (157.0...167.0) Spread cm3 : 8.00 1000 s: (12.0)

1st version 1mm rack travel less than

full load rack tr: 10.10 : 1090...1105 Speed rom

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 50.0...80.0

1000 s: (46.0...84.0)

Rack travel in mm : 10.00...10.30

:

Remarks:

Speed

Spread

Aneroid pressure h: -

**CDM** Del.quantity cm3/: 130.0...132.0

: 500

cm3 : 8.00

1000 s: (12.0)

1000 s: (127.0...135.0)

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : MB : 21.09.92 Edition : 07.92 Replaces Test oil : ISO-4113 Combination no. : 0 402 646 798 Injection pump Pump designation: PE6P120A320LS7854 EP type number : 0 412 626 872 Governor Governor design. : RQV350...950PA870-17 : 0 421 814 005 Governer no. Customer-spec. information Customer : MERCEDES-BENZ Engine : 0M441 LA : 250.0 1st version kW : 1900 Rated speed TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Overflow quantity min. 1/h: 100...120 Test nozzle holder assembly : 1 688 901 105 Opening. pressure, bar : 207...210 Orifice plate

diameter mm : 0.8

Test lines : 1 680 750 075

Outside diameter x Wall thickness x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values \_\_\_

: 8.00x2.50x1000

BEGINNING OF DELIVERY Test pressure, bar: 25...27

: 5.20...5.30 Prestroke mm : (5.15...5.35) Rack travel in mm : 20.00...21.00

Firing order : 6-3-5-2-4-1

Phasina : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no.

BASIC SETTING

1st speed rpm: 950

Rack travel in mm : 14.50...14.60

Del.quantity cm3/: 25.1...25.3

100 s: (24.8...25.6)

Spread cm3 : 0.5

100 s: (0.9)

rpm : 350.02nd speed Rack travel in mm : 5.1...5.7 Del.quantity cm3/ : 1.6...2.2 100 s: (1.3...2.5)

cm3 : 0.6 Spread 100 s: (1.0)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL 1st speed rpm : 350

: 1.30...1.80 travel mm 2nd speed : 570 rpm

: 3.90...4.40 travel mm

3rd speed : 850 rpm travel mm

: 5.70...6.20 4th speed : 1008 rom

travel mm : 7.40...7.90

5th speed : 1110 rom : 9.80...10.30 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1 rpm : 1080

Speed Rack travel in mm : 11.70...14.30

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm ; 950 Speed Aneroid pressure h: 1200

Del.quantity : 251.0...256.0)

: 5.00 cm3 1000 : (9.00)

RATED SPEED

1st version

Control Lever

position degrees: 113...121

Testina:

1st rack travel in: 13.50

Speed rpm : 990...1000

2nd rack travel in: 4.00

rpm : 1070...1100 Speed

4th rack travel in: 1300

Speed rpm : 0.00...1.40

LOW IDLE 1

Control lever

position degrees: 63...71

Testing:

: 250 Speed mon

Minimum rack trave: 7.70

rpm : 350

Rack travel in mm : 5.30...5.50

CONSTANT REGULATION

rpm : 350...450 Speed

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed : 500 **CDM** 

Pressure hPa : -

Rack travel mm : 10.10...10.40

Measurement

1/min : 500Speed

1st pressure hPa : 350

Rack travel in m: 11.40...11.50

2nd pressure hPa : 600

Rack travel in m: 12.60...12.80

START CUT-OUT

1/min: 270 (290) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200

: 600 Speed rpm

Del.quantity cm3/: 263.0...267.0 1000 s: (260.0...270.0)

cm3 : 8.00 Spread

1000 s: (12.0)

Aneroid pressure h: ~

Speed rpm : 500 Del.quantity cm3/ : 135.0...137.0

1000 s: (132.0...140.0)

cm3 : 8.00 Spread

1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.50

Speed : 990...1000 rom

STARTING FUEL DELIVERY

Speed rpm ; 100

Del.quantity cm3/: 240.0...260.0

•

1000 s: (236.0...264.0)

Remarks:

**APPLICATION** 

Pistenbully

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : SCA : 21.09.92 Edition Replaces : 07.92 Test oil : ISO-4113 Combination no. : 0 402 646 910 Injection pump Pump designation : PE6P120A320RS7138 EP type number : 0 412 626 822 Governor Governor design. : RQV200...1100PA712-5 : 0 421 813 951 Governer no. Customer-spec. information Customer : SCANIA Engine : DS9 08 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder assembly : 1 688 901 104 Opening : 250...253 pressure, bar Orifice plate diameter mm : 0.7 Test lines : 1 680 750 008 Outside diameter x Wall thickness x Length mm : 6.00X2.00X600 (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY Test pressure, bar: 25...27 Prestroke mm : 4.40...4.50 : (4.35...4.55) Rack travel in mm : 9.00...12.00 E27

Firing order : 1-5-3-6-2-4 : 0-60-120-180-240-300 Phasing Tolerance  $+ - ^{\circ} : 0.50 (0.75)$ Time to cyl. no. : 1 BASIC SETTING rpm: 700 1st speed Rack travel in mm: 13.00...13.10 Del.quantity cm3/: 18.0...18.2 100 s: (17.7...18.5) Spread cm3 : 0.6100 s: (0.9) rpm : 250.02nd speed Rack travel in mm: 4.9...5.1 Del.quantity cm3/: 1.2...1.6 100 s: (-) cm3 : 0.5Spread 100 s: (0.9) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL rpm : 225 1st speed : 0.90...1.30 travel mm rpm : 350 2nd speed travel mm : 2.50...3.10 3rd speed rpm : 650 travel mm : 5.40...6.00 rpm : 1145 4th speed travel mm : 8.90...9.10 rpm : 1280 5th speed : 10.10...10.50 travel mm GUIDE SLEEVE POSITION Control-lever position Degree: -1 rpm : 1130 Rack travel in mm : 15.20...17.80 FULL LOAD DELIV. AT FULL LOAD STOP 1st version rpm : 700 Speed Aneroid pressure h: 900

Del.quantity : 180.0...182.0 1000 : (177.0...185.0)

Spread cm3: 6.00

1000 : (9.00)

## RATED SPEED

1st version Control lever

position degrees: 114...122

Testina:

1st rack travel in: 12.00

rpm : 1140...1150 Speed

2nd rack travel in: 4.00

Speed rpm : 1275...1305 4th rack travel in: 1400

Speed rpm : 0.00...1.00

LOW IDLE 1 Control lever

position degrees: 61...69

Testing:

Speed rpm : 100 Minimum rack trave: 6.50

Speed rpm : 250 Rack travel in mm : 4.90...5.10

Rack travel in mm: 2.00

Speed rom : 300...360

Aneroid/Altitude Compensator Test

1st version

Setting

Speed : 500 rom hPa : 900 Pressure

Rack travel mm : 13.00...13.10

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 9.90...10.30

2nd pressure hPa : 480

Rack travel in m: 12.30...12.40

3rd pressure hPa : 220

Rack travel in m: 10.70...10.90

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900 Speed rpm : 1100

Del.quantity cm3/: 163.0...171.0

1000 s: (161.0...173.0)

Aneroid pressure h: -

Speed rpm : 500 Del.quantity cm3/: 114.0...118.0

1000 s: (112.0...120.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.00

Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 120.0...140.0

1000 s: (-)

Rack travel in mm: 9.90...10.30

LOW TOLE

Speed

Speed rpm : 250 Rack travel in mm : 4.90...5.10

Remarks:

Delivery-valve spring pre-tension

3.2...3.4 mm.

Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring preload on new delivery-valve holders to 2.9...3.1 mm.

Start-of-delivery setting with ROBO

diaphragm.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 11,0 t12 Edition : 21.09.92 Replaces : 05.91

Test oil : ISO-4113

Combination no. : 0 402 646 945

Injection pump

Pump designation : PE6P120A320LS7808-2

EP type number : 0 412 626 833

Governor

Governor design. : RQV350...950PA870-11

: 0 421 813 928 Governer no.

Customer-spec. information

Customer : MERCEDES-BENZ

Engine : 0M441 LA

1st version kW : 243.0 Rated speed : 1900

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 1 688 901 019 assembly

**Opening** 

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter x Wall thickness

: 6.00x1.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30

: (5.15...5.35)

Rack travel in mm : 20.00...21.00

Firing order : 6-3-5-2-4-1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 13.90...14.10

Del.quantity cm3/: 21.4...21.6

100 s: (21.1...21.9)

cm3 : 0.5Spread

100 s: (0.9)

2nd speed rpm : 350.0 Rack travel in mm : 5.1...5.7 Del.quantity cm3/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm3 : 0.6

100 s: (1.0)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 350 1st speed

: 1.30...1.80 travel mm

rpm : 570 2nd speed

: 3.90...4.40 travel mm

3rd speed rpm : 850

travel mm : 5.70...6.20 rpm : 1008

4th speed

travel mm : 7.40...7.90

5th speed : 1110 rpm

: 9.60...10.30 travel mm

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1 rom : 1060 Speed

Rack travel in mm : 12.50...15.10

FULL LOAD DELIV. AT FULL LOAD STOP

1st version Speed rpm : 600 1/min : 270 (290) Speed Aneroid pressure h: 900 Del.quantity : 214.0...216.0 FUEL DELIVERY CHARACTERISTICS 1000 : (211.0...219.0) cm3 : 5.00 1000 : (9.00) Spread 1st version Aneroid pressure h: 1350 RATED SPEED Speed : 950 rpm Del.quantity cm3/: 240.0...243.0 1st version 1000 s: (237.0...246.0) Control Lever Spread : 8.00 cm3 position degrees: 111...119 1000 s: (12.0) Aneroid pressure h: 1350 Testina: Speed rpm : 800 1st rack travel in: 13.80 Del.quantity cm3/: 237.0...241.0 Speed rpm : 990...1000 1000 s: (234.0...244.0) 2nd rack travel in: 4.00 Spread cm3 : 8.00: 1065...1095 Speed rpm 1000 s: (12.00 4th rack travel in: 1300 Aneroid pressure h: 1350 Speed rpm : 0.00...1.00Speed 950 rom Del.quantity cm3/: 200.0...202.6 \* LOW IDLE 1 1000 s: (197.0...205.0) Control lever Spread cm3 : 8.00position degrees: 63...71 1000 s: (12.0) Aneroid pressure h: -Testing: : 500 Speed rpm Speedi : 200 Del.quaritity cm3/: 145.0...147.0 nom Minimum rack trave: 7.30 1000 s: (142.0...150.0) : 350 rom Spread cm3 : 8.00 Rack travel in mm : 5.10...5.70 1000 s: (12.0) CONSTANT REGULATION rpm : 350...600 Speed BREAKAWAY Aneroid/Altitude 1st version Compensator Test 1mm rack travel less than full load rack tr: 13.80 1st version Speed rpm : 990...1000 Settina Speedi COM : 600 STARTING FUEL DELIVERY Pressure hPa : 900 Rack travel : 13.90...14.10 mn Speed : 100 man Measurement Del.quantity cm3/: 205.0...225.0 Speed 1/min: 600 1000 s: (201.0...229.0) 1st pressure hPa : 300 Remarks: Rack travel in m: 11.00...11.20 2nd pressure hPa : 550 Rack travel in m: 13.10...13.30 3rd pressure hPa : 1100 Rack travel in m: 14.10...14.30 \* = Set at reduced-delivery stop. 4th pressure hPa : 1200 Rack travel in m: 14.50...14.70 5th pressure hPa : -Rack travel in m: 9.50...9.80 START CUT-OUT

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks

: PEN 7,2 a : 21.09.92 Test sheet Edition Replaces : 10.91 Test oil : ISO-4113

Combination no. : 0 402 646 948

Injection pump

Pump designation: PE6P120A320RS7233-1

EP type number

: 0 412 626 849 Governor

Governor design. : RQV300...1300PA1003K

: 0 421 815 281 Governer no.

Customer-spec. information Customer : PENTA

Engine : TAMD 72 A

1st version kW : 316.0 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 457 413 010

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 105 assembly

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter x Wall thickness

x Length mm : 6.00x1.50x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.30...3.40

: (3.25...3.45)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

Phasina : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rom : 1300

Rack travel in mm : 13.80...13.90

Del.quantity cm3/: 24.9...25.1

100 s: (24.6...25.4)

Spread cm3 : 0.6

100 s: (1.0)

2nd speed rpm : 290.0

Rack travel in mm: 5.8...6.0 Del.quantity cm3/: 1.5...2.1

100 s: (1.3...2.3)

cm3 : 0.7Spread 100 s: (1.1)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 275

travel mm : 1.30...1.50

2nd speed rpm : 325

: 2.00...2.20 travel mm

3rd speed rpm : 475

travel mm : 3.20...3.40

4th speed rpm : 890

travel mm : 6.30...6.50

5th speed rpm : 1350

travel mm : 9.90...10.10

GUIDE SLEEVE POSITION

Control-lever position Degree: -1

rpm : 1500

Rack travel in mm : 6.00...12.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

Speed rom : 1300Aneroid pressure h: 2400

Del.quantity : 249.0...251.0 1000 : (246.0...254.0) : 6.00 Spread cm3 1000 : (10.00) RATED SPEED 1st version Control lever position degrees: 118...126 Testina: 1st rack travel in: 12.80 Speed rpm : 1335...1345 2nd rack travel in: 4.00 rpm : 1460...1490 Speed 4th rack travel in: 1550 Speed rom : 0.00...1.00LOW IDLE 1 Control lever position degrees: 75...79 Testing: Speed rpm : 100 Minimum rack trave: 7.00 mon? Rack travel in mm : 5.80...6.00 CONSTANT REGULATION Speed rpm : 300...520 TORQUE CONTROL Dimension a mm :? Torque control curve - 1st version 1st speed rpm : 1300 Rack travel in m: 13.80...13.90 rpm : 1200 2nd speed Rack travel in m: 13.40...13.70 rpm : 1000 3rd speed Rack travel in m: 12.30...12.70 4th speed rpm : 800 Rack travel in m: 11.40...11.60 Aneroid/Altitude Compensator Test 1st version Setting Speed rpm : 1300 hPa : 2400 Pressure : 13.80...13.90 Rack travel mm Measurement Speed 1/min: 1300

Rack travel in m: 7.40...7.50 3rd pressure hPa : 1250 Rack travel in m: 13.20...13.40 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 2400 : 800 Speed man Del.quaritity cm3/: 233.0...239.0 1000 s: (231.0...241.0) cm3 : 9.00Spread 1000 s: (13.0) Aneroid pressure h: 2400 : 1000 Speed rpm Del.quantity cm3/: 240.0...248.0 1000 s: (238.0...250.0) Aneroid pressure h: rpm : 500 Speed Del.quantity cm3/: 112.0...114.0 1000 s: (109.0...117.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 12.80 rpm : 1335...1345 Speed LOW IDLE Speed : 290 rom Rack travel in mm : 5.80...6.00 Del.quantity cm3/: 15.0...21.0 1600 s: (13.0...23.0) cm3 : 7.00Spread 1000 s: (11.00) Remarks: : Start-of-delivery setting with ROBO diaphragm.

1st pressure hPa : -

Rack travel in m: 7.20...7.50

2nd pressure hPa : 270

Note remarks

Test sheet : DAF

: 05.10.92 Edition Replaces : 03.92

Test oil : ISO-4113

Combination no. : 0 402 646 968

Injection pump

Pump designation : PE6P12OA32ORS7248

EP type number : 0 412 626 861

Governor

Governor design. : RQV275 ...1150PA986

Governer no. : 0 421 813 920

Customer-spec. information

Customer : DAF

: RS 222 L Engine

1st version kW : 222.0 Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 120...140

Test nozzle holder

assembly : 1 688 901 105

Openina

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

: 1 680 750 089 Test Lines

Outside diameter x Wall thickness

x Lenath mm : 8.00x2.50x600

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.20...5.30 Prestroke mm

: (5.15...5.35)

Rack travel in mm : 14.00...15.00 Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance  $+ - \cdot : 0.50 (0.75)$ 

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 4.90...5.10 & maximum rack tra: 11.7...12.7

Difference ° CS : 2.25...3.75

BASIC SETTING

1st speed rpm: 1000

Rack travel in mm : 12.20...12.30

Del.quantity cm3/: 18.4...18.6

100 s: (18.1...18.9)

Spread cm3 : 0.5

100 s: (0.9)

rpm : 275.02nd speed

Rack travel in mm: 5.3...5.5

Del.quantity cm3/: 1.3...1.9

100 s: (1.0...2.2)

cm3 : 0.8 Spread

100 s: (1.2)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 275

travel mm : 1.20...1.60

2nd speed rpm : 315

: 1.80...2.20 travel mm

3rd speed rpm : 1205

travel mm : 8.10...8.50

rpm : 1340 4th speed

: 9.70...9.90 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1325 Speed

Rack travel in mm : 9.90...12.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1000 Speed Aneroid pressure h: 1000

Del.quantity : 184.0...186.0

1000 : (181.0...189.0)

: 5.00 Spread cm3 1000 : (9.00)

RATED SPEED

1st version Control lever

position degrees: 115...123

Testina:

1st rack travel in: 11.20

rpm : 1190...1200 Speed

2nd rack travel in: 4.00

rom: 1295...1325 Speed

4th rack travel in: 1450

Speed rpm : 0.00...1.40

LOW IDLE 1 Control lever

position degrees: 79...37

Testina:

Speed : 175 MOM Minimum rack trave: 6.30 rpm : 275

Rack travel in mm : 4.60...4.80

CONSTANT REGULATION

rpm : 315...365 Speed

Anaroid/Altitude Compensator Test

1st version

Settina

: 600 Speed rpm Pressure hPa : 1000

: 12.20...12.30 Rack travel mm

Measurement

1/min: 600 Speed

1st pressure hPa : -

Rack travel in m: 9.30...9.50

2nd pressure hPa : 420

Rack travel in m: 11.60...11.70 3rd pressure hPa : 240

Rack travel in m: 10.30...10.50

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

Speed rpm : 600 Del.quantity cm3/: 120.0...122.0

1000 s: (117.0...125.0)

**BREAKAWAY** 

1st version

1mm rack traval less than

full load rack tr: 11.20

rpm : 1190...1200 Speed

LOW IDLE

Speed : 275 rom

Rack travel in mm : 4.60...4.80

Remarks:

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1

start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks

Test sheet

: DAF

Edition Replaces Test oil

: 05.10.92 : 03.92 : ISO-4113

Combination no.

: 0 402 646 970

Injection pump

EP type number

Pump designation : PE6P120A320RS7248Y : 0 412 626 863

Governor

Governer no.

Governor design. : RQV275...1150PA985

: 0 421 813 920

Customer-spec. information Customer : DAF

Engine

: RS 180 L

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 120...140

Test nozzle holder

assembly : 1 688 901 105

Openina (

pressure, bar

: 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 089

Outside diameter

x Wall thickness

x Length mm

: 8.00X2.50X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30

: (5.15...5.35)

Rack travel in mm : 14.00...15.00

: 1-5-3-6-2-4 Firing order

Phasina : 0-60-120-180-240-300

Tolerance  $+ - ^{\circ} : 0.50 (0.75)$ 

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 4.90...5.10 & maximum rack tra: 10.2...11.2 Difference ° CS : 2.25...3.75

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 10.70...10.80

Del.quantity cm3/: 14.5...14.7

100 s: (14.2...15.0)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 275.0 Rack travel in mm: 5.3...5.5 Del.quantity cm3/ : 1.3...1.9

100 s: (1.0...2.2)

Spread cm3 : 0.8100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

moin : 275 1st speed

: 1.20...1.60 travel mm rpm : 315

2nd speed

travel mm : 1.80...2.20

3rd speed rpm : 1205

: 8.10...8.50 travel mm

rpm : 1340 4th speed

: 9.70...9.90 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1 rpm : 1340

Speed Rack travel in mm : 8.40...11.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed nom : 1000

Aneroid pressure h: 1000

: 145.5...147.5 Del.quantity 1000 : (142.5...150.5)

: 5.00 Spread cm3

1000 : (9.00)

RATED SPEED

1st version Control lever

position degrees: 116...124

Testing:

1st rack travel in: 9.70

Speed rpm : 1180...1190

2nd rack travel in: 4.00

rpm : 1265...1295 Speed

4th rack travel in: 1450

Speed rpm : 0.00...1.40

LOW IDLE 1 Control lever

position degrees: 79...87

Testing:

Speed :pn : 175 Minimum rack trave: 6.20 rpm : 275

Rack travel in mm : 4.60...4.80

CONSTANT REGULATION

rpm : 315...365 Speed

Aneroid/Altitude Compensator Test

1st version

Setting

Speed : 600 rpm Pressure hPa : 1000

Rack travel mm : 10.70...10.80

Measurement

1/min: 600 Speed

1st pressure hPa : -

Rack travel in m: 9.40...9.60

2nd pressure hPa : 260

Rack travel in m: 10.30...10.40 3rd pressure hPa : 190

Rack travel in m: 9.80...10.00

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -Speed rpm : 600

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Del.quantity cm3/: 119.0...121.0

1000 s: (116.0...124.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 9.70

Speed rpm : 1180...1190

LOW IDLE

Speed rpm : 275
Rack travel in nam : 4.60...4.30

Remarks:

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1

start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS Prestroke mm : 4.50...4.60 : (4.45...4.65) Note remarks Rack travel in mm : 9.00...12.00 Firing order : 1-6-3-5-2-4 Test sheet : LIE : 25.09.92 Edition : 08.92 Replaces Test oil : 1SO-4113 Phasing : 0-60-120-180-240-300 Combination no. : 0 402 646 982 Tolerance + - \* : 0.50 (0.75) Injection pump BASIC SETTING Pump designation: PE6P120A320LS7848 EP type number : 0 412 626 866 1st speed rpm : 1050Governor Governor design. : RQV300...1050PA1034 Rack travel in mm : 14.90...15.00 Governer no. : 0 421 813 993 Del.quantity cm3/: 25.9...26.1 Customer-spec, information Customer : LIFBHERR 100 s: (25.6...26.4) Engine : 0 9306 TI Spread cm3 : 0.51st version kW : 270.0 100 s: (0.9) Rated speed : 2100 2nd speed riom: 350.0 Rack travel in mm : 5.5...5.9 Del.quantity cm3/: 3.0...3.6 TEST BENCH REQUIREMENTS Test oil 100 s: (2.7...3.9) inlet temp. °C : 38...42 Spread cm3 : 0.6100 s: (1.0) Overflow valve : 1 417 413 025 (B) Setting of injection pump with governor Inlet press., bar: 1.50 GUIDE SLEEVE TRAVEL Test nozzle holder ist speed rpm : 350 assembly : 1 688 901 105 travel mm : 1.70...2.10 2nd speed rpm : 405 Openina travel mm : 2.40...2.90 pressure, bar : 207...210 3rd speed : 550 rom : 4.20...4.60 travel man Orifice plate 4th speed : 780 rpm diameter mm : 0,8 travel mm : 6.30...6.90 : 1118 5th speed rpm : 10.40...10.60 travel mm : 1 680 750 075 Test Lines GUIDE SLEEVE POSITION Outside diameter Control-lever position x Wall thickness Degree: -1 x Length mm : 8.00x2.50x1000 Speed rpm : 1185 Rack travel in mm : 12.60...15.20 (A) Injection pump setting values Insp. values in parentheses FULL LOAD DELIV. AT FULL LOAD STOP Set equal delivery quant. per values 1st version Speed rpm : 1050 BEGINNING OF DELIVERY Aneroid pressure h: 1500

Del.quantity

259.0...261.0 1000 : (256.0...264.0)

Test pressure, bar: 25...27

: 5.00 Spread cm3 1000 : (9.00) RATED SPEED 1st version Control lever position degrees: 103...111 Testina: 1st rack travel in: 13.90 Speed rpm : 1100...1110 2nd rack travel in: 4.00 Speed rpm : 1200...1230 4th rack travel in: 1300 Speed rpm : 0.00...1.00LOW IDLE 1 Control Lever position degrees: 68...76 Testina: Speed : 250 COM Minimum rack trave: 8.90 Speed : 350 rpm Rack travel in mm : 5.60...5.80 CONSTANT REGULATION Speed nom : 350...420 Aneroid/Altitude Compensator Test 1st version Setting Speed rom : 700 Pressure hPa : 1500 Rack travel mm : 14.90...15.00 Measurement 1/min : 700 Speed 1st pressure hPa : -Rack travel in m: 11.70...11.90 2nd pressure hPa : 950 Rack travel in m: 14.60...14.70 3rd pressure hPa : 750 Rack travel in m: 13.00...13.20 START CUT-OUT 1/min: 220 (240) Speed FUEL DELIVERY CHARACTERISTICS

LOW IDLE

;

Remarks:

F10

Speed

1st version

Aneroid pressure h: -

rom : 700

BOSCH INJ. PUMP TEST SPECIFICATIONS Test pressure, bar: 25...27 Note remarks : 4.50...4.60 Prestroke mm : (4.45...4.65) Rack travel in mm : 9.00...12.00 Test sheet : LIE Edition : 25.09.92 Firing order : 1-6-3-5-2-4 Replaces Test oil : ISO-4113 Combination no. : U 402 646 982A : 0-60-120-180-240-300 Phasing Phasing Injection pump Tolerance + - ° : 0.50 (0.75) Pump designation : PE6P12DA32DLS7848 EP type number : 0 412 626 866 BASIC SETTING Governor Governor design. : RQV300...1050PA1034 rpm: 1050 1st speed Governer no. : 0 421 813 993 Rack travel in mm : 14.90...15.00 Cust. part no. : 9273581 Del.quantity cm3/: 25.9...26.1 Customer-spec. information Customer 100 s: (25.6...26.4) : LIEBHERR Engine : D 9306 TI Spread cm3 : 0.51st version: kW : 270.0 100 s: (0.9) Rated speed : 2100 2nd speed rpm : 350.0 TEST BENCH REQUIREMENTS Rack travel in mm: 5.5...5.9 Del.quantity cm3/: 3.0...3.6 Test oil 100 s: (2.7...3.9) inlet temp. °C : 38...42 Spread cm3 : 0.6100 s: (1.0) Overflow valve : 1 417 413 025 (B) Setting of injection pump with governor Inlet press., bar: 1.50 GUIDE SLEEVE TRAVEL Test nozzle holder rpm : 350 1st speed assembly : 1 688 901 105 1.70...2.10 travel mm 2nd speed rpm : 405 Opening travel mm : 2.40...2.90 : 207...210 pressure, bar 3rd speed rpm : 550 : 4.20...4.60 travel mm Orifice plate rpm : 780 4th speed diameter mm : 0,8 : 6.30...6.90 travel mm rpm : 1118 5th speed : 10.40...10.60 travel mm Test Lines : 1 680 750 075 GUIDE SLEEVE POSITION Outside diameter Control-lever position x Wall thickness Degree: -1 x Lenath mm : 8.00x2.50x1000 rpm : 1185 Speed Rack travel in mm : 12.60...15.20 (A) Injection pump setting values

FULL LOAD DELIV. AT FULL LOAD STOP

Aneroid pressure h: 1500

rpm : 1050

1st version

Speed

BEGINNING OF DELIVERY

per values

Insp. values in parentheses

Set equal delivery quant.

Del.quantity : 259.0...261.0

1000 : (256.0...264.0)

Spread cm3: 5.00 1000 : (9.00)

RATED SPEED

1st version Control Lever

position degrees: 103...111

Testing:

1st rack travel in: 13.90 Speed rpm : 1100...1110

2nd rack travel in: 4.00

rpm : 1200...1230 Speed

4th rack travel in: 1300

Speed rom : 0.00...1.00

LOW IDLE 1

Control Lever

position degrees: 68...76

Testing:

Speed : 250 rpm Minimum rack trave: 8.90 : 350 Speed rom

Rack travel in mm: 5.60...5.80

Rack travel in mm: 2.00

Speed COM : 430...490

CONSTANT REGULATION

rpm : 350...420 Speed

Aneroid/Altitude Compensator Test

1st version

Setting

Speed : 700 **MQ** hPa : 1500 Pressure

Rack travel mm : 14.90...15.00

Measurement

1/min: 700 Speed

1st pressure hFa : -

Rack travel in m: 11.70...11.90

2nd pressure hPa : 950

Rack travel in m: 14.60...14.70 3rd pressure hPa : 750

Rack travel in m: 13.00...13.20

START CUT-OUT

1/min: 100 (80) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: rpm : 700 Speed

Del.quantity cm3/: 194.0...196.0 1000 s: (191.0...199.0)

Spread cm3 : 8.00

1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.90

rpm : 1100...1110 Speed

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 150.0...170.0

1000 s: (146.0...174.0)

LOW IDLE

Speed rpm : 350
Rack travel in mm : 5.50...5.90
Del.quantity cm3/ : 30.0...36.0

1000 s: (27.0...39.0)

Spread cm3 : 6.00

1000 s: (10.00)

Remarks:

F12

BOSCH INJ. PUMP TEST SPECIFICATIONS : 5.20...5.30 Prestroke mm : (5.15...5.35) Rack travel in mm : 20.00...21.00 Firing order : 6-3-5-2-4-1 Note remarks Test sheet : MB : 05.10.92 Edition Replaces : 08.92 Test oil : ISO-4113 Phasing : 0-60-120-180-240-300 Combination no. : 0 402 646 993 Tolerance + - • : 0.50 (0.75) Injection pump Time to cyl. no. : 6 Pump designation : PE6P12OA320LS7852 EP type number : 0 412 626 871 BASIC SETTING Governor Governor design. : RQ300/1050PA1030-3 1st speed rpm: 600 Governer no. : 0 421 801 653 Rack travel in mm : 14.00...14.10 Customer-spec. information Customer : MERCEDES-BENZ Del.quantity cm3/: 23.4...23.6 Engine : 0M441 LA 100 s: (23.1...23.9) 1st version kW : 250.0 cm3 : 0.5Spread Rated speed : 2100 100 s: (0.9) TEST BENCH REQUIREMENTS 2nd speed rpm : 300.0 Test oil Rack travel in mm: 5.6...6.2 inlet temp. °C : 38...42 Del.quantity cm3/: 1.6...2.2 100 s: (1.3...2.5) Overflow valve Spread cm3 : 0.6: 1 417 413 025 100 s: (1.0) Inlet press., bar: 1.50 GUIDE SLEEVE POSITION Control-lever position Test nozzle holder Degree: -2 : 1 688 901 105 assembly Speed rpm : 600 Rack travel in mm: 19.20...20.80 Opening | pressure, bar : 207...210 FULL LOAD DELIV. AT FULL LOAD STOP Orifice plate 1st version diameter mm : 0.8 Speed rpm : 600 Aneroid pressure h: 1100 Del.quantity : 234.0...236.0 1000 : (231.0...239.0) Test lines : 1 680 750 075 : 5.00 Spread cm3 Outside diameter 1000 : (9.00) x Wall thickness : 8.00X2.50X1000 x Length mm RATED SPEED (A) Injection pump setting values 1st version Insp. values in parentheses Set equal delivery quant. Setting point: per values Speed rom

Rack travel in mm: 20.0

1st rack travel in: 12.90

Testing:

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

rom : 1095...1110 Speed 2nd rack travel in: 4.00 Speed rpm : 1180...1210 4th rack travel in: 1300 Speed rpm : 0.00...1.50LOW IDLE 1 Setting point w/out bumper spring mpm : 300° Rack travel in mm: 5.9 Testing: rpm : 200 Speed Minimum rack trave: 8.30 rpm : 300 Speed Rack travel in mm : 5.80...6.00 Rack travel in mm : 2.00 rpm : 370...410 Speed TORQUE CONTROL Dimension a mm 2nd speed rpm : 1050 Rack travel in m: 13.80...14.00 3rd speed rpm : 800 Rack travel in m: 14.40...14.60 Aneroid/Altitude Compensator Test 1st version Setting : 500 Speed rpm hPa : -Pressure Rack travel mm : 10.00...10.30 Measurement 1/min: 500 Speed 1st pressure hPa : 300 Rack travel in m: 10.70...10.80 2nd pressure hPa : 700 Rack travel in m: 12.80...13.00 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1100 Speed rpm : 1050 Del.quantity cm3/: 223.0...227.0 1000 s: (220.0...230.0) cm3 : 8.00 Spread 1000 s: (12.0) Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/ : 130.0...132.0

1000 s: (127.0...135.0)

cm3 : 8.00

1000 s: (12.0)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 12.90 Speed rpm : 1095...1110

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity\_cm3/ : 45.0...75.0 1000 s: (41.0...79.0)

Rack travel in mm : 10.00...10.40

Remarks:

F14

Spread

Note remarks

Test sheet

: MB

Edition

: 05.10.92

Replaces

: 05.92

Test oil

: ISO-4113

Combination no.

: 0 402 646 994

Injection pump

Pump designation: PE6P120A320LS7852

EP type number

: 0 412 626 871

Governor

Governor design. : RQ300/950PA1032-3

Governer no.

: D 421 801 654

Customer

Customer-spec. information

: MERCEDES-BENZ

Engine

: OM441 LA

1st version kW

: 250.0

Rated speed

: 1900

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly

: 1 688 901 105

Opening.

pressure, bar

: 207...210

Orifice plate

diameter mm

: 0,8

Test lines

: 1 680 750 075

Outside diameter

x Wall thickness

x Length mm

: 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 5.20...5.30

: (5.15...5.35)

Rack travel in mm : 20.00...21.00

Firing order

: 6-3-5-2-4-1

Phasing

: 0-60-120-180-240-300

Tolerance + - \*

: 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed

rpm: 600

Rack travel in mm : 14.00...14.10

Del.quantity cm3/: 23.4...23.6

100 s: (23.1...23.9)

Spread

cm3 : 0.5

100 s: (0.9)

rpm : 300.0

2nd speed Rack travel in mm : 5.6...6.2 Del.quantity cm3/ : 1.6...2.2

100 s: (1.3...2.5)

Spread

Speed

cm3 : 0.6

100 s: (1.0)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

rpm : 600

Aneroid pressure h: 1100

Del.quantity 1000

: 234.0...236.0 : (231.0...239.0)

Spread

cm3 : 5.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

rpm

: 600

Rack travel in mm: 20.0

Testing:

Speed

1st rack travel in: 13.00

rpm : 990...1005 Speed 2nd rack travel in: 4.00 : 1065...1095 Speed man 4th rack travel in: 1200 Speed mom : 0.00...1.50LOW IDLE 1 Setting point w/out bumper spring Speed : 300 rom Rack travel in mm: 5.9 Testing: : 200 Speed rpm Minimum rack trave: 8.30 Soeca rpm : 300 Rack travel in mm : 5.80...6.00 Rack travel in mm : 2.00 : 370...410 Speed MOM Ameroid/Altitude Compensator Test 1st version Setting : 500 Speed PDII: Pressure hPa : 10.10...10.40 Rack travel mm Measurement 1/mir: : 500 Spead 1st pressure hPa : 300 Rack travel in m: 10.80...10.90 2nd pressure hPa : 700 Rack travel in m: 12.90. .13.10 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1100 Speed : 950 rpm Del.quantity cm3/: 228.0...232.0 1000 s: (225.0...235.0) Spread cm3 : 8.001000 s: (12.0) Aneroid pressure h: -Speed : 500 rpm: Del.quantity cm3/: 132.0...134.0 1000 s: (129.0...137.0) Spread cm3 : 8.00

1000 s: (12.0)

full load rack tr: 13.00 Speed rpm : 990...1005

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 50.0...80.0 1000 s: (46.0...84.0)

Rack travel in mm : 10.10...10.50

Remarks:

F16

**BREAKAWAY** 

1st version

1mm rack travel less than

Note remarks

Test sheet

Edition

: 05.10.92

Replaces

: 08.92

Test oil

: ISO-4113

Combination no.

: 0 402 646 996

Injection pump

Pump designation : PE6P120A320LS7852

EP type number

: 0 412 626 871

Governor

Governor design. : RQ300/1050PA1031-4

Governer no.

: 0 421 801 656

Customer

Customer-spec. information

: MERCEDES-BENZ

Engine

: 0M441 LA

1st version kW

: 250.0

Rated speed

: 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

assembly

: 1 688 901 105

Opening

pressure, bar

: 207...210

Orifice plate

diameter mm

: 0,8

Test lines

: 1 680 750 075

Outside diameter

x Wall thickness

x Length mm

: 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 5.20...5.30

: (5.15...5.35)

Rack travel in mm : 20.00...21.00

Firing order : 6-3-5-2-4-1

Phasing

: 0-60-120-180-240-300

Tolerance + - •

: 0.50 (0.75)

Time to cyl. no.

BASIC SETTING

1st speed

rom : 600

Rack travel in mm: 14.00...14.10

Del.quantity cm3/: 23.4...23.6

100 s: (23.1...23.9)

cm3 : 0.5

Spread

100 s: (0.9)

2nd speed

700.0

Rack travel in mm: 5.6...6.2 Del.quantity cm3/: 1.6...2.2

100 s: (1.3...2.5)

Spread

Speed

cm3 : 0.6

100 s: (1.0)

GUIDE SLEEVE POSITION Control-lever position

Degree: -2

rpm : 600

Rack travel in mm: 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

rpm : 600

Aneroid pressure h: 1100 Del.quantity

: 234.0...236.0

1000 : (231.0...239.0)

Spread

: 5.00 cm3

1000 : (9.00)

RATED SPEED

1st version

Speed

Setting point:

rpm

: 600

Rack travel in mm: 20.0

F17

Testing:

1st rack travel in: 12.80

rpm : 1090...1105 Speed

2nd rack travel in: 4.00

: 1180...1210 Speed rpm

4th rack travel in: 1300

rpm : 0.00...1.50 Speed

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 300 Rack travel in mm : 5.9

Testina:

Speed rpm : 200 Minimum rack trave: 8.10 Speed

rpm : 300

Rack travel in mm : 5.80...6.00 Rack travel in mm : 2.00

Speed : 380...420 rpm

TORQUE CONTROL

Dimension a mm : 0.20

2nd speed rpm : 1050

Rack travel in m: 13.80...14.00

3rd speed rpm : 800

Rack travel in m: 14.50...14.70

Ameroid/Altitude Compensator Test

1st version

Setting

Speed : 500 המח Pressure hPa :

: 10.00...10.30 Rack travel mm

Measurement

Speed 1/min: 500

1st pressure hPa : 300

Rack travel in m: 10.70...10.80

2nd pressure hPa : 700

Rack travel in m: 12.80...13.00 3rd pressure hPa : 1000 Rack travel in m: 14.00...14.10

START CUT-OUT

1/min : 220 (240) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1100 Speed rpm : 1050 Del.quantity cm3/: 223.0...227.0 1000 s: (220.0...230.0)

Spread cm3 : 8.00

1000 s: (12.0)

Aneroid pressure h: -

Speed rpm : 500 Del.quantity cm3/ : 130.0...132.0 1000 s: (127.0...135.0)

Spread am3 : 8.00

1000 s: (12.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 12.80

Speed rpm : 1090...1105

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 255.0...275.0 1000 s: (251.0...279.0)

:

Remarks:

F18

BOSCH INJ. PUMP TEST SPECIFICATIONS : 5.20...5.30 Prestroke mm : (5.15...5.35) Note remarks Rack travel in mm : 20.00...21.00 Firing order : 6-3-5-2-4-1 Firing order Test sheet : 05.10.92 Edition : 08.92 Replaces Test oil : ISO-4113 Phasing : 0-60-120-180-240-300 Combination no. : 0 402 646 997 Tolerance + - \* : 0.50 (0.75) Injection pump Time to cyl. no. : 6 Pump designation : PE6P120A320LS7852 EP type number : 0 412 626 871 BASIC SETTING Governor Governor design. : RQV300...950PA1033-5 1st speed rpm: 600 : 0 421 814 008 Governer no. Rack travel in mm : 14.00...14.10 Customer-spec. information Customer : MERCEDES-BENZ Del.quantity cm3/: 23.4...23.6 : 0M441 LA Engine 100 s: (23.1...23.9) 1st version kW : 250.0 Spread cm3 : 0.5Rated speed : 1900 100 s: (0.9) TEST BENCH REQUIREMENTS rpm : 300.0 2nd speed Test oil Rack travel in mm: 5.6...6.2 inlet temp. °C : 38...42 Del.quantity cm3/: 1.6...2.2 100 s: (1.3...2.5) Overflow valve cm3 : 0.6Spread : 1 417 413 025 100 s: (1.0) Inlet press., bar: 1.50 (B) Setting of injection pump with governor Test nozzle holder : 1 688 901 105 assembly GUIDE SLEEVE TRAVEL 1st speed rpm : 300 Openina : 1.00...1.50 travel mm : 207...210 pressure, bar rpm : 575 2nd speed : 4.20...4.70 travel mm Orifice plate 3rd speed rpm : 790 diameter mm : 0,8 5.90...6.40 travel mm : 1010 4th speed rpm : 8.00...8.50 travel mm Test lines : 1 680 750 075 5th speed rpm : 1200 travel mm : 11.00...12.00 Outside diameter x Wall thickness GUIDE SLEEVE POSITION : 8.00x2.50x1000 x Length mm Control-lever position Degree: -1 (A) Injection pump setting values Speed rpm : 1075 Insp. values in parentheses Rack travel in mm : 11.70...14.30 Set equal delivery quant. per values \_\_\_\_ FULL LOAD DELIV. AT FULL LOAD STOP BEGINNING OF DELIVERY 1st version

Speed

rpm : 600

Aneroid pressure h: 1100

Test pressure, bar: 25...27

Del.quantity : 234.0...236.0 1000 : (231.0...239.0) Spread : 5.00 cm3 1000 : (9.00) RATED SPEED 1st version Control lever position degrees: 116...124 Testina: 1st rack travel in: 13.00 Speed rpm : 990...1000 2nd rack travel in: 4.00 Speed man : 1070...1100 4th rack travel in: 1200 Speed rpm : 0.00...1.40 LOW IDLE 1 Control lever position degrees: 80...88 Testing: Speed r'om : 200 Minimum rack trave: 8.10 : 300 Dm Rack travel in mm : 5.80...6.00 Rack travel in mm : 2.00 Speed : 410...470 וחסרו CONSTANT REGULATION Speed rpm : 290...360 Aneroid/Altitude Compensator Test 1st version Settina Speed : 500 חוכרו Pressure hPa Rack travel mm : 10.10...10.40 Measurement 1/min : 500Speed 1st pressure hPa : 300 Rack travel in m: 10.80...10.90 2nd pressure hPa : 700 Rack travel in m: 12.90...13.10 3rd pressure hPa : 1100 Rack travel in m: 14.00...14.10

1st version Aneroid pressure h: 1100 Speed rpm : 950 Del.quantity cm3/ : 228.0...232.0 1000 s: (225.0...235.0) Spread cm3 : 8.001000 s: (12.0) Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/ : 132.0...134.0 1000 s: (129.0...137.0) cm3 : 8.00Spread 1000 s: (12.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 13.00 Speed rom : 990...1000STARTING FUEL DELIVERY Speed : 100 rom Del.quantity cm3/: 255.0...275.0 1000 s: (251.0...279.0) Remarks:

Speed

START CUT-OUT

Note remarks

Test sheet

Edition

: 05.10.92

Replaces

: 08.92

Test oil

: ISO-4113

Combination no.

: 0 402 646 998

Injection pump

Pump designation : PE6P120A320LS7852

EP type number

: 0 412 626 871

Governor

Governor design.

: RQV300...1050PA1033

Governer no.

: 0 421 814 009

Customer-spec. information

Customer

: MERCEDES-BENZ

Engine

: 0M441 LA

1st version kW

: 250.0

Rated speed

: 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

assembly

: 1 688 901 105

Opening

pressure, bar

: 207...210

Orifice plate

diameter mm

: 0,8

Test lines

: 1 680 750 075

Outside diameter

× Wall thickness

x Length mm

: 8.00x2.50x1000

(A) Injection pump setting values

Insp. values in parentheses

Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 5.20...5.30

Rack travel in mm : 20.00...21.00

: (5.15...5.35)

Firing order

: 6-3-5-2-4-1

Phasing

: 0-60-120-180-240-300

Tolerance + - \*

: 0.50 (0.75)

Time to cyl. no.

BASIC SETTING

1st speed

rom: 600

Rack travel in mm : 14.00...14.10

Del.quantity cm3/: 23.4...23.6

100 s: (23.1...23.9)

Spread

Spread

cm3 : 0.5

100 s: (0.9)

rpm : 300.0

2nd speed Rack travel in mm: 5.6...6.2

Del.quantity cm3/: 1.6...2.2 100 s: (1.3...2.5)

cm3 : 0.6

100 s: (1.0)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

1st speed

rpm : 300

0.50...1.00 travel mm

2nd speed travel mm

rpm : 575

: 4.30...4.80

3rd speed travel mm

rpm : 625 : 4.80...5.30

4th speed

travel mm

Speed

rpm : 830

: 5.90...6.40

travel mm 5th speed

rpm : 1190

: 9.80...10.30

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1170

Rack travel in mm : 11.70...14.30

FULL LOAD DELIV. AT FULL LOAD STOP

1st version Speed mom : 600Aneroid pressure h: 1100 : 234.0...236.0 Del.quantity 1000 : (231.0...239.0) : 5.00 cm3 Spread 1000 : (9.00) RATED SPEED 1st version Control lever position degrees: 116...124 Testing: 1st rack travel in: 12.90 rpm : 1090...1105 Speed 2nd rack travel in: 4.00 : 1165...1195 Speed ř 10m 4th rack travel in: 1300 Speed rom : 0.00...1.50LOW IDLE 1 Control Leven position degrees: 78...86 Testing: Speed rpm Minimum rack trave: 8.70 : 300 mqn: Rack travel in mm : 5.80...6.00 CONSTANT REGULATION rpm : 300...400 Speed TORQUE CONTROL : 0.20 Dimension a mm : 1050 2nd speed man Rack travel in m: 13.80...14.00 rpm : 300 3rd speed Rack travel in m: 14.00...14.20 Aneroid/Altitude Compensator Test 1st version Setting : 500 Speed CDM Pressure hPa : -Rack travel mm : 10.00...10.30 Measurement 1/min : 500 Speed

3rd pressure hPa : 1100 Rack travel in m: 14.00...14.10 START CUT-OUT 1/min: 240 (260) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1100 : 1050 Speed rpm Del.quantity cm3/: 223.0...227.0 1000 s: (220.0...230.0) Spread cm3 : 8.001000 s: (12.0) Aneroid pressure h: rpm : 500 Speed Del.quantity cm3/: 130.0...132.0 1000 s: (127.0...135.0) cm3 : 8.00 Spread 1000 s: (12.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 12.90 rpm : 1090...1105 Speed Remarks:

1st pressure hPa : 300

2nd pressure hPa : 700

Rack travel in m: 10.70...10.80

Rack travel in m: 12.80...13.00

Note remarks

Test sheet : MB 14,7 z : 21.09.92 Edition Replaces : 04.92 Test oil : ISO-4113

Combination no. : 0 402 648 923

Injection pump

Pump designation : PE8P120A320LS7840-1

EF type number : 0 412 628 862

Governor

: RQV350...1050PA866 Governor design.

-16

: 0 421 813 961 Governer no.

Customer-spec, information

Customer : MERCEDES-BENZ

: 0M442 A Engine

1st version kW : 250.0 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzie holder

: 1 688 901 105 assembly

Opening .

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter

x Wall thickness

x Length mm : 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30

: (5.15...5.35)

Rack travel in mm : 20.00...21.00 : 8-7-2-6-3-5firing order

Phasing : 0-45-90-135-180-225-

270-315

Tolerance + - \* : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rom: 600

Rack travel in mm : 13.40...13.60

Del.quantity cm3/: 21.2...21.4

100 s: (20.9...21.7)

cm3 : 0.6 Spread

100 s: (0.9)

rpm : 350.02nd speed

Rack travel in mm: 5.8...6.4 Del.quantity cm3/: 1.6...2.2

100 s: (1.3...2.5)

Spread cm3 : 0.6

100 s: (1.0)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350

travel mm : 1.30...1.80

2nd speed rpm : 454

travel mm : 2.80...3.30

3rd speed rpm : 900

travel mm : 5.40...5.90

: 1107 4th speed rpm

: 7.80...8.30 travel mm

5th speed : 1204 rpm

: 9.80...10.30 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1 rpm : 1120 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP 1st pressure hPa : 300 Rack travel in m: 11.10...11.30 2nd pressure hPa : 550 Rack travel in m: 12.40...12.60 1st version rpm : 600 Speed Aneroid pressure h: 800 3rd pressure hPa : 1100 Del.quantity : 212.0...214.0 Rack travel in m: 13.50...13.60 \* 1000 : (209.0...217.0) 4th pressure hPa : 1200 : 6.00 Spread ന്ന് Rack travel in m: 13.80...14.00 1000 : (9.00)5th pressure hPa : -Rack travel in m: 10.60...10.90 RATED SPEED START CUT-OUT 1st version Control lever 1/min : 270 (290) Speed position degrees: 118...126 FUEL DELIVERY CHARACTERISTICS Testing: 1st rack travel in: 11.80 rom : 1090...1100 1st version 2nd rack travel in: 4.00 Aneroid pressure h: 1400 rpm : 1160...1190 Speed : 1050 Speed rpm 4th rack travel in: 1200 Del.quantity cm3/: 195.0...198.0 rpm : 0.00...1.00Speed 1000 s: (192.0...201.0) cm3 : 8.00 Spread LOW IDLE 1 1000 s: (12.0) Control lever Aneroid pressure h: 1400 position degrees: 66...74 : 800 Speed rpm Del.quantity cm3/: 236.0...240.0 1000 s: (233.0...243.0) Testina: : 250 Speed cm3 : 8.00 mc<sub>i</sub>n Spread Minimum rack trave: 7.60 1000 s: (12.0) : 350 Speed nom. Aneroid pressure h: -Rack travel in mm : 6.00...6.20 : 500 Speed rpm Del.quantity cm3/: 132.0...134.0 CONSTANT REGULATION 1000 s: (129.0...137.0) rpm : 350...500 Speed Spread cm3 : 8.001000 s: (12.0) TORQUE CONTROL Dimension a mm : 0.70 Torque control curve - 1st version BREAKAWAY 1st speed rom : 1050 Rack travel in m: 12.80...13.00 1st version : 900 2nd speed rpm 1mm rack travel less than Rack travel in m: 13.50...13.60 rpm : 800 3rd speed full load rack tr: 11.80 Rack travel in m: 14.10...14.30 Speed rpm : 1090...1100 Aneroid/Altitude STARTING FUEL DELIVERY Compensator Test : 100 Speed rpm 1st version Del.quantity cm3/: 200.0...220.0 Setting 1000 s: (196.0...224.0) : 600 Speed mom hPa : 800 Pressure Remarks: : 13.40...13.60 Rack travel mm Measurement \* Increase in control-rod travel with 1/min: 600 Speed respect to setting at least 0.1 mm

Note remarks

Test sheet : MB 14,7 e 1 Edition : 21.09.92

: 11.91 Replaces Test oil : ISO-4113

Combination no. : 0 402 648 924

Injection pump

Pump designation: PE8P120A320LS7840-1

EP type number : 0 412 628 862

Governor

Governor design.: RGV350...950PA866-17

: 0 421 813 962 Governer no.

Customer spec. information

: MERCEDES-BENZ Customer

: 0M442 A Engine

1st version kW : 250.0 Rated speed : 1900

TEST BENCH REQUIREMENTS

Test oil

inlet temp. \*C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 1 688 901 105 assembly

Openina

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter x Wall thickness

x Length mm : 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30

: (5.15...5.35) Rack travel in mm : 20.00...21.00

: 8-7-2-6-3-5-Firing order

: 0-45-90-135-180-225-Phasing

270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rom: 600

Rack travel in mm : 13.40...13.60

Del.quantity cm3/: 21.2...21.4

100 s: (20.9...21.7)

Spread cm3 : 0.6

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm: 5.8...6.4 Del.quantity cm3/: 1.6...2.2

100 s: (1.3...2.5)

cm3 : 0.6 Spread 100 s: (1.0)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350

: 1.30...1.80 travel mm

2nd speed rpm : 424 : 2.3C...2.80 rpm : 700 travel man

3rd speed

: 4.10...4.60 travel mm

rpm : 1008 4th speed

: 7.80...8.30 travel mm

rpm : 1220 5th speed

: 11.00...12.00 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1 rpm : 1020 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

Rack travel in m: 11.10...11.30 1st version Speed rpm : 600 Aneroid pressure h: 800 : 212.0...214.0 Del.quantity 1000 : (209.0...217.0) cm3 : 6.00Spread 1000 : (9.00) RATED SPEED 1st version Control Lever position degrees: 118...126 Testina: 1st rack travel in: 11.80 rpm : 990...1000 2nd rack travel in: 4.00 rpm : 1070...1100 Speed 4th rack travel in: 1200 rpm : 0.00...1.00 Speed LOW IDLE 1 Control lever position degrees: 82...90 Testing: Speed rpm Minimum rack trave: 7.10 Speed rpm : 350 Rack travel in mm : 6.00...6.20 CONSTANT REGULATION Speed rpm : 350...550 TORQUE CONTROL Dimension a mm : 1.30 Torque control curve - 1st version 1st speed rpm : 950 Rack travel in m: 12.80...13.00 rpm : 850 2nd speed Rack travel in m: 13.80...13.90 : 800 3rd speed rpm Rack travel in m: 14.10...14.30 Aneroid/Altitude Compensator Test 1st version Setting : 600 Speed **LOW** hPa : 800 Pressure : 13.40...13.60 Rack travel mm Measurement 1/min: 600 Speed 1st pressure hPa : 300

2nd pressure hPa : 550 Rack travel in m: 12.40...12.60 3rd pressure hPa : 1100 Rack travel in m: 13.50...13.60 \* 4th pressure hPa : 1200 Rack travel in m: 13.80...14.00 5th pressure hPa : Rack travel in m: 10.60...10.90 START CUT-OUT 1/min: 270 (290) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1400 : 950 Speed rpm Del.quantity cm3/: 195.0...198.0 1000 s: (192.0...201.0) Spread cm3 : 8.001000 s: (12.0) Aneroid pressure h: 1400 Speed : 800 rpm Del.quantity cm3/: 236.0...240.0 1000 s: (233.0...243.0) cm3 : 8.00Spread 1000 s: (12.0) Aneroid pressure h: -: 500 Speed rpm Del.quantity cm3/: 132.0...134.0 1000 s: (129.0...137.0) cm3 : 8.00 Spread 1000 s: (12.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 11.80 rpm : 990...1000 Speed STARTING FUEL DELIVERY Speed : 100 rpm Del.quantity cm3/: 200.0...220.0 1000 s: (196.0...224.0) Remarks: \* Increase in control-rod travel with respect to setting at least 0.1 mm

Note remarks

Test sheet

Edition : 21.09.92

Replaces

Test oil : ISO-4113

Combination no. : 0 402 648 937

Injection pump

Pump designation : PE8P120A320LS7840-10

EP type number : 0 412 628 856

Governor

Governor design. : RQV300...1050PA1033

Governer no. : C 421 814 001

Customer-spec. information

Customer : MERCEDES-BENZ

Engine : OM442 A

1st version kw : 250.0 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 1 688 901 105

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter

x Wall thickness

x Length mm : 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30

: (5.15...5.35) Rack travel in mm : 20.00...21.00

Firing order : 8-7-2-6-3-5-

Phasing : 0-45-90-135-180-225-

Phasing : 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no.

BASIC SETTING

1st speed rpm: 700

Rack travel in mm : 13.30...13.40

Del.quantity cm3/: 20.9...21.1

100 s: (20.6...21.4)

Spread cm3 : 0.6

100 s: (0.9)

2nd speed rpm : 300.0Rack travel in mm: 6.2...6.8 Del.quantity cm3/: 1.0...1.6

100 s: (0.7...1.9)

Spread cm3 : 0.8100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 0.60...1.00

2nd speed

rpm : 575 : 4.20...4.80 travel mm

3rd speed rpm : 830

travel mm : 5.80...6.40

4th speed rpm : 1107

travel mm : 8.30...8.50

rpm : 1290 5th speed

: 11.00...12.00 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

Speed rpm : 1190

Rack travel in mm : 10.40...13.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

nom : 700 Aneroid pressure h: 1200 : 209.0...211.0 Del.quantity 1000 : (206.0...214.0) : 6.00 Spread cm3 1000 : (9.00) RATED SPEED 1st version Control Lever position degrees: 116...124 Testina: 1st rack travel in: 11.80 rpm : 1090...1100 Speed 2nd rack travel in: 4.00 rpm : 1145...1175 4th rack travel in: 1300 Speed rpm : 0.00...1.00LOW IDLE 1 Control lever position degrees: 79...87 Testing: Speed man : 200 Minimum rack trave: 9.40 rpm : 300 Rack travel in mm : 6.40...6.60 CONSTANT REGULATION Speed rpm : 300...450 TORQUE CONTROL Dimension a mm : 0.60 Torque control curve - 1st version 1st speed rpm : 1050 Rack travel in m: 12.70...12.90 rpm : 900 2nd speed Rack travel in m: 13.00...13.10 3rd speed rpm : 700 Rack travel in m: 13.30...13.40 Aneroid/Altitude Compensator Test 1st version Setting Speed : 500 rpm hPa : -Pressure : 11.00...11.30 Rack travel mm

Rack travel in m: 12.60...12.80 3rd pressure hPa : 1200 Rack travel in m: 13.30...13.40 START CUT-OUT 1/min : 220 (240) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1200 rpm : 1050 Speed Del.quantity cm3/: 192.0...196.0 1000 s: (189.0...199.0) cm3 : 8.00Spread 1000 s: (12.0) Aneroid pressure h: rpm : 500 Del.quantity cm3/: 136.0...138.0 1000 s: (133.0...141.0) Spread cm3 : 8.001000 s: (12.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 11.80 Speed rpm : 1090...1100 STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/: 190.0...210.0 1000 s: (186.0...214.0) Remarks:

Measurement

Speed

1/min: 500

1st pressure hPa : 350 Rack travel in m: 11.30...11.40

2nd pressure hPa : 700

Note remarks

Test sheet : MB

Edition : 05.10.92

Replaces : -

Test oil : ISO-4113

Combination no. : 0 402 648 938

Injection pump

Pump designation : PE8P120A320LS7840-10

EP type number : 0 412 628 856

Governor

Governor design. : RQ300/1050PA1030-2

Governer no. : 0 421 801 652

Customer-spec. information

Customer : MERCEDES-BENZ

Engine : 0M442 A

1st version kW : 250.0 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 1 688 901 105

**Opening** 

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter x Wall thickness

x Length mm : 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30

: (5.15...5.35) Rack travel in mm : 20.00...21.00

Firing order : 8-7-2-6-3-5-

- 1

Phasing : 0-45-90-135-180-225-

270-315

Tolerance  $+ - \circ : 0.50 (0.75)$ 

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm: 700

Rack travel in mm : 13.30...13.40

Del.quantity cm3/: 20.9...21.1

100 s: (20.6...21.4)

Spread cm3 : 0.6

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 6.2...6.8 Del.quantity cm3/ : 1.0...1.6

100 s: (0.7...1.9)

Spread cm3 : 0.8

100 s: (1.2)

GUIDE SLEEVE POSITION Control-lever position

Degree: -2

Speed rpm: 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700 Aneroid pressure h: 1200

Del.quantity : 209.0...211.0

1000 : (206.0...214.0)

Spread cm3 : 6.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 600 Rack travel in mm : 20.0

Testing:

1st rack travel in: 11.70 rpm : 1090...1105 Speed 2nd rack travel in: 4.00 Speed COM : 1170...1200 4th rack travel in: 1300 Speed rpm : 0.00...1.00LOW IDLE 1 Setting point w/out bumper spring rpm : 300 Rack travel in mm: 6.5 Testing: Speed : 2**C**O rom Minimum rack trave: 8.80 : 300 rpm Rack travel in mm : 6.40...6.60 Rack travel in mm: 2.00 rpm : 380...420 Speed TORQUE CONTROL Dimension a mm :? Torque control curve - 1st version rpm : 1050 1st speed Rack travel in m: 12.70...12.90 2nd speed rpm : 700 Rack travel in m: 13.30...13.50 Aneroid/Altitude Compensator Test 1st version Setting Speed : 500 rpm Pressure hPa : -Rack travel mm : 11.00...11.30 Measurement Speed 1/min: 500 1st pressure hPa : 350 Rack travel in m: 11.30...11.40 2nd pressure hPa : 700 Rack travel in m: 12.60...12.80 3rd pressure hPa : 1200 Rack travel in m: 13.30...13.40 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1200 Speed rpm : 1050 Del.quantity cm3/ : 192.0...196.0 1000 s: (189.0...199.0) Spread cm3 : 8.00 1000 s: (12.0) Aneroid pressure h: -Speed rpm : 500

Del.quantity cm3/: 136.0...138.0 1000 s: (133.0...141.0) Spread cm3 : 8.00 1000 s: (12.0)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 11.70 Speed rpm : 1090...1105

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 50.0...70.0 1000 s: (46.0...74.0)

Remarks:

G03

Note remarks

Test sheet : MB

Edition : 21.09.92

Replaces : -

Test oil : ISO-4113

Combination no. : 0 402 648 945

Injection pump

Pump designation : PE8P120A320LS7847

EP type number : 0 412 628 863

Governor

Governor design. : RQ300/1050PA1030-6

Governmen no. : 0 421 801 666

Customer-spec. information

Customer : MERCEDES-BENZ

Engine : 0M402 LA

1st version kW : 280.0

Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

assembly : 1 688 901 105

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter x Wall thickness

x Length mm : 8.00x2.50x1000

A Let get initi

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60

: (5.45...5.65)

Rack travel in mm : 20.00...21.00 Firing order : 8-7-2-6-3-5-

4-1

Phasing : 0-45-90-135-180-225-

270-315

Tolerance  $+ - \circ : 0.50 (0.75)$ 

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm: 1050

Rack travel in mm : 13.90...14.00

Del.quantity cm3/: 21.1...21.3

100 s: (20.8...21.6)

Spread cm3 : 0.6

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm: 5.9...6.5

Del.quantity cm3/: 1.0...1.6

100 s: (0.7...1.9) Spread cm3 : 0.6

100 s: (1.0)

GUIDE SLEEVE POSITION Control-lever position

Degree: -2

Speed rpm: 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050 Aneroid pressure h: 1200

Del.quantity : 211.0...213.0

1000 : (208.0...216.0)

Spread cm3 : 6.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm: 20.0 Testina: 1st rack travel in: 13.00 rpm : 1090...1105 Speed 2nd rack travel in: 4.00 rpm : 1170...1200 Speed 4th rack travel in: 1300 Speed rpm : 0.00...1.43LOW IDLE 1 Setting point w/out bumper spring Speed rpm : 300 Rack travel in mm: 6.2 Testing: Speed : 200 rpm Minimum rack trave: 8.30 Speed : 300 man Rack travel in mm : 6.10...6.30 Rack travel in mm : 2.00 : 370...410 Speed rpm TORQUE CONTROL Dimension a mm : 0.30 Torque control curve - 1st version rpm : 1050 1st speed Rack travel in m: 13.90...14.00 npm : 550 2nd speed Rack travel in m: 14.80...15.00 Aneroid/Altitude Compensator Test 1st, version Setting Speed rom : 500 Pressure hPa : -Rack travel mm : 10.10...10.40 Measurement Speed 1/min: 500 1st pressure hPa : 350 Rack travel in m: 10.70...10.80 2nd pressure hPa : 700 Rack travel in m: 12.20...12.40 3rd pressure hPa : 1200 Rack travel in m: 14.20...14.40

FUEL DELIVERY CHARACTERISTICS

: 550

1000 s: (221.0...231.0)

Aneroid pressure h: 1200

rpm Del.quantity cm3/: 224.0...228.0

cm3 : 8.00 Spread 1000 s: (12.0) Aneroid pressure h: -Speed rpm : 500Del.quantity cm3/: 134.0...136.0 1000 s: (131.0...139.0) Spread cm3 : 8.001000 s: (12.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 13.00 Speed rpm : 1090...1105 Remarks: :

Speed

1st version

Note remarks

Test sheet

Edition : 21.09.92

Replaces

Test oil : ISO-4113

Combination no. : 0 402 648 946

Injection pump

Pump designation : PE8P120A320LS7847

EP type number : 0 412 628 863

Governor

Governor design. : RQ300/1050PA1031-7

: 0 421 801 667 Governer no.

Customer-spec. information

Customer : MERCEDES-BENZ

Engine : OM402 LA

1st version kW : 280.0 : 2100 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 1 688 901 105 assembly

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test Lines : 1 680 750 075

Outside diameter

x Wall thickness

x Length mm : 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.50...5.60 : (5.45...5.65) Prestroke mm

Rack travel in mm : 20.00...21.00

Firing order : 8- 7- 2- 6- 3- 5-

Phasing : 0-45-90-135-180-225-

270-315

Tolerance + - \* : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm: 1050

Rack travel in mm : 13.90...14.00

Del.quantity cm3/: 21.1...21.3

100 s: (20.8...21.6)

cm3 : 0.6Spread

100 s: (0.9)

2nd speed rpm : 300.0 Rack travel in mm : 5.9...6.5

Del.quantity cm3/: 1.6...2.2 100 s: (1.3...2.5)

cm3 : 0.6Spread

100 s: (1,6)

GUIDE SLEEVE POSITION Control-lever position

Degrea: -2

rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050 Aneroid pressure h: 1200

Del.quantity

: 211.0...213.0 1000 : (208.0...216.0)

: 6.00 cm3

Spread

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed : 600 LDUI

Rack travel in mm : 20.0 Testing: 1st rack travel in: 12.90 Speed rpm : 1090...1105 2nd rack travel in: 4.00 Speed : 1175...1205 man 4th rack travel in: 1300 Speed riom : 0.00...1.40 LOW IDLE 1 Setting point w/out bumper spring rpm : 300 Rack travel in mm: 6.2 Testina: Speed : 200 rpm Mirrimum rack trave: 8.40 : 300 Speed rpm Rack travel in mm : 6.10...6.30 Rack travel in mm : 2.00 : 380...420 Speed rom TORQUE CONTROL Dimension a nm : 0.30 Torque control curve - 1st version rpm : 1050 1st speed Rack travel in m: 13.90...14.10 : 550 2nd speed rpm Rack travel in m: 14.90...15.10 Aneroid/Altitude Compensator Test 1st version Setting Speed : 500 rpm Pressure hPa : -Rack travel mm : 10.10...10.40 Measurement Speed  $1/\min : 500$ 1st pressure hPa : 350 Rack travel in m: 10.70...10.80 2nd pressure hPa : 700 Rack travel in m: 12.20...12.40 3rd pressure hPa : 1200 Rack travel in m: 14.20...14.40 START CUT-OUT Speed 1/min : 220 (240)

Speed : 550 nom . Del.quantity cm3/: 224.0...228.0 1000 s: (221.0...231.0) Spread cm3 : 8.001000 s: (12.0) Aneroid pressure h: rpm : 500 Speed Del.quantity cm3/: 134.0...136.0 1000 s: (131.0...139.0) Spread cm3 : 8.001000 s: (12.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 12.90 Speed rpm : 1090...1105 Remarks: : **APPLICATION** Omnibus

1st version

Aneroid pressure h: 1200

FUEL DELIVERY CHARACTERISTICS

Note remarks

Test sheet : MB

: 21.09.92 Edition

Replaces

Test oil : ISO-4113

Combination no. : 0 402 648 947

Injection pump

Pump designation : PE8P120A320LS7859

EP type number : 0 412 628 869

Governor

Governor design. : RQ300/950PA1032-5

: 0 421 801 668 Governer no.

Customer-spec. information

Customer : MERCEDES-BENZ

Engine : 0M442 LA

1st version kW : 320.0 : 1900 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 1 688 901 105 assembly

Opening |

: 207...210 pressure, bar

Orifice plate

diameter mm : 0.8

Test lines : 1 680 750 075

Outside diameter

x Wall thickness

x Length mm : 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.20...5.30 Prestroke mm

: (5.15...5.35)

Rack travel in mm : 20.00...21.00

: 8-7-2-6-3-5-Firing order

Phasing : 0-45-90-135-180-225-

270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm: 950

Rack travel in mm : 14.10...14.20

Del.quantity cm3/: 23.1...23.3

100 s: (22.8...23.6)

cm3 : 0.6Spread

100 s: (0.9)

rpm : 300.0 2nd speed

Rack travel in mm: 6.2...6.8 Del.quantity cm3/: 1.6...2.2

100 s: (1.3...2.5)

cm3 : 0.6Spread

100 s: (1.0)

GUIDE SLEEVE POSITION Control-lever position

Degree: -2

rpm : 600 Speed

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 950 Speed Aneroid pressure h: 1000

Del.quantity : 231.0...233.0

1000 : (228.0...236.0)

Spread cm3 : 6.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed : 600 rpm

Rack travel in mm: 20.0 Testing: 1st rack travel in: 13.10 Speed : 990...1005 rpm 2nd rack travel in: 4.00 rpm : 1065...1095 Speed 4th rack travel in: 1200 Speed : 0.00...1.50 L DOU LOW IDLE 1 Setting point w/out bumper spring rpm : 300 Rack travel in mm: 6.5 Testina: Speed mom : 200 Minimum rack trave: 8.80 : 300 Speed חמר Rack travel in mm : 6.40...6.60 Rack travel in mm : 2.00 Speed : 380...420 rpm Aneroid/Altitude Compensator Test 1st version Setting : 500 Speed rpm Pressure hPa : -Rack travel mm : 10.70...10.80 Measurement 1/min: 500 Speed 1st pressure hPa : 250 Rack travel in m: 11.00...11.10 2nd pressure hPa : 600 Rack travel in m: 13.00...13.20 3rd pressure hPa : 1000 Rack travel in m: 14.10...14.20 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1000 Speed rpm : 550 Del.quantity cm3/: 243.0...247.0 1000 s: (240.0...250.0) Spread cm3 : 8.001000 s: (12.0) Aneroid pressure h: -: 500 Speed rpm Del.quantity cm3/: 142.0...144.0 1000 s: (139.0...147.0) Spread cm3 : 8.00

1000 s: (12.0)

## BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 13.10

Speed rpm : 990...1005

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS BEGINNING OF DELIVERY Test pressure, bar: 25...27 Note remarks : 5.20...5.30 : (5.15...5.35) Prestroke mm Test sheet Edition : 21.09.92 Rack travel in mm : 20.00...21.00 Replaces Firing order : 8- 7- 2- 6- 3- 5-Test oil : ISO-4113 Combination no. : 0 402 648 948 Injection pump Phasina : 0-45-90-135-180-225-Pump designation : PE8P120A320LS7859 270-315 EP type number : 0 412 628 869 Tolerance + - ° : 0.50 (0.75)Governor Governor design. : RQ300/1050PA1030-7 Time to cyl. no. : 8 Governer no. : 0 421 801 669 BASIC SETTING Customer-spec. information Customer : MERCEDES-BENZ 1st speed rpm: 1050 Engine : 0M442 LA Rack travel in mm : 13.70...13.80 : 320.0 1st version kW Del.quantity cm3/: 22.3...22.5 : 2100 Rated speed 100 s: (22.0...22.8) TEST BENCH REQUIREMENTS Spread cm3 : 0.6Test oil inlet temp. °C : 38...42 100 s: (0.9) rpm : 300.0 Overflow valve 2nd speed : 1 417 413 025 Rack travel in mm: 6.2...6.8 Del.quantity cm3/: 1.6...2.2 Inlet press., bar: 1.50 100 s: (1.3...2.5) Spread cm3 : 0.6Overflow 100 s: (1.0) quantity min. 1/h: 100...120 GUIDE SLEEVE POSITION Test nozzle holder Control-lever position : 1 688 901 105 assembly Degree: -2 Speed rpm : 600 Rack travel in mm : 19.20...20.80 Opening | : 207...210 pressure, bar FULL LOAD DELIV. AT FULL LOAD STOP Orifice plate diameter mm : 0.8 1st version Speed rpm : 1050Aneroid pressure h: 1000 Test lines : 1 680 750 075 Del.quantity : 223.0...225.0 1000 : (220.0...228.0) Outside diameter Spread cm3 : 6.00 x Wall thickness 1000 : (9.00) : 8.00x2.50x1000 x Length mm RATED SPEED (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. 1st version per values \_\_\_ Setting point:

Speed

: 600

rpm

Rack travel in mm : 20.0 Testing: 1st rack travel in: 13.00 rpm : 1090...1105 Speed 2nd rack travel in: 4.00 rpm : 1170...1200 Speed 4th rack travel in: 1300 Speed rpm : 0.00...1.50LOW IDLE 1 Setting point w/out bumper spring rpm : 300 Rack travel in mm : 6.5 Testing: : 200 Speed rpm Minimum rack trave: 8.80 : 300 Spæed rpm Rack travel in mm : 6.40...6.60 Rack travel in mm : 2.00 Speed : 380...420 rom TORQUE CONTROL Dimension a mm :? Torque control curve - 1st version 1st speed rpm : 1050 Rack travel in m: 13.70...13.80 d speed rpm : 500 2nd speed rpm Rack travel in m: 14.60...14.80 Aneroid/Altitude Compensator Test 1st version Settina Speed : 500 man hPa : Pressure Rack travel mm : 10.70...11.00 Measurement Speed 1/min : 500 1st pressure hPa : 250 Rack travel in m: 11.00...11.10 2nd pressure hPa : 600 Rack travel in m: 13.00...13.20 3rd pressure hPa : 1000 Rack travel in m: 14.10...14.30 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1000 Speed : 550 CDM

Del.quantity cm3/: 243.0...247.0 1000 s: (240.0...250.0) Spread cm3 : 8.00 1000 s: (12.0) Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/: 139.0...141.0 1000 s: (136.0...143.0) Spread cm3 : 8.00

Spread cm3 : 8.00 1000 s: (12.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 13.00 Speed rpm : 1090...1105

:

Remarks:

G11

Note remarks

Test sheet : MMM 21,6 c : 21.09.92 Edition Replaces : 11.90

Test oil : ISO-4113

Combination no.

: 0 402 670 808

Injection pump

Pump designation : PE12P120A520/5RS7212

EP type number : 0 412 620 823

Governor

Governor design. : RSUV325...1150P0A359

: 0 421 829 108 Governer no.

Customer-spec. information Customer : MWM

Engine : TBD234V12

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter x Wall thickness

x Length mm : 6.00x1.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 4.60...4.70 Prestroke mm : (4.55...4.75)

Rack travel in mm : 9.00...12.00

Firing order

: 1- 2- 9- 10- 5- 6-11- 12- 3- 4- 7- 8

Phasing : 0-30-60-90-120-150-

180-210-240-270-300-

330

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm: 1150

Rack travel in mm : 13.40...13.50

Del.quantity cm3/: 26.0...26.2

100 s: (25.8...26.6)

Spread cm3 : 0.5

100 s: (0.9)

rpm : 325.0 2nd speed Rack travel in mm: 6.9...7.1 Del.quantity cm3/: 3.0...4.0 100 s: (2.7...4.3)

Spread cm3 : 0.6

100 s: (1.0)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3 rpm : 300

Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : 4.00

RATED SPEED

Speed

1st version Control lever

position degrees: 106...114

Testing:

1st rack travel in: 12.40

rpm : 1190...1200 Speed

2nd rack travel in: 4.00

rpm : 1260...1290 Speed

4th rack travel in: 1440

Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever

position degrees: 71...79

Setting point w/out bumper spring

rpm : 325 Rack travel in mm: 6.5

Testing:

Speed CIDIN : 100 Minimum rack trave: 19.50

rpm : 325

Rack travel in mm : 6.90...7.10

Rack travel in mm: 2.00

Speed : 440...500 ("D(")

Aneroid/Altitude Compensator Test

1st version Setting

Speed : 500 rpm Pressure hPa : 1250

Rack travel mm : 13.40...13.50

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 9.30...9,50

2nd pressure hPa : 625

Rack travel in m: 12.00...12.10

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 12.40

Sceed rpm : 190...1200

STARTING FUEL DELIVERY

Speed : 100 COM

Del.quantity cm3/: 330.0...370.0

1000 s: (-)

HIGH IDLE

1st version

Speed rpm : 325

Rack travel in mm: 9.20...9.40 Del.quantity cm3/: 85.0...105.0 1000 s: (-)

LOW IDLE

Speed rpm : 325 Rack travel in mm : 7.90...8.10

Del.quantity cm3/: 0 \* 1000 s: (-)

Remarks:

\* = Element disconnected at idle for cylinders 2, 4, 6, 8, 10 and 12.

Hydraulic latching of starting delivery.

Latching at 0.75 bar...0.85 bar.

Unlatching at 0.35 bar...0.45 bar.

Full-load delivery not known. Set according to engine test report.

Test specifications upon request.

Note remarks

Test sheet : MB 9,6 t Edition : 21.09.92 Replaces : 12.91 Test oil : ISO-4113

Combination no. : 0 402 676 811

Injection pump

Pump designation: PE6P120A320LS7834-1

EP type number : 0 412 626 857

Governor

Governor design. : RSV675...1050P0A826

-2

: 0 421 833 366 Governer no.

Customer-spec. information

Customer : MERCEDES-BENZ

Engine : 0M 401 LA

1st version kW : 205.0 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

assembly : 1 688 901 019

Openina

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter

x Wall thickness

: 6.00x1.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60 : (5.45...5.65)

Rack travel in mm : 19.00...21.00 Firing order : 6-3-5-2-4-1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm: 1030

Rack travel in mm : 14.10...14.20

Del.quantity cm3/: 22.1...22.3

100 s: (21.8...22.5)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 675.0 Rack travel in mm: 4.2...4.6

Del.quantity cm3/: 1.6...2.2

100 s: (1.3...2.5) cm3 : 0.6

Spread 100 s: (1.0)

GUIDE SLEEVE POSITION

Control-lever position Degree: -3

rpm : 800 Speed

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x :?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1030

Del.quantity : 221.0...223.0

1000 : (218.0...225.0)

Spread cm3 : 5.00

1000 : (9.00)

RATED SPEED

1st version

Control lever

position degrees: 85...93

Testing:

1st rack travel in: 13.10

rpm : 1070...1080 Speed

2nd rack travel in: 4.00

mpm : 1100...118 Speed

4th rack travel in: 1300 Speed rpm : 0.30...1.40

LOW IDLE 1 Control lever

position degrees: 70...78

Setting point w/out bumper spring

rpm : 675 Rack travel in mm: 4.3

Testing:

Speed rpm : 100

Minimum rack trave: 19.50 rpm : 675 Speed

Rack travel in mm : 4.00...4.60

Mack travel in non: 2.00

rpm : **680.**..720 Speed

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 700

Del.quantity cm3/: 214.0...218.0 1000 s: (211.0...221.0)

cm3 : 8.00 Spread

1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.10

rpm : 1070...1080 Speed

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 240.0...260.0

1000 s: (236.0...264.0)

LOW IDLE

rpm

Rack travel in mm: 4.20...4.60

Del.quantity cm3/: 16.0...22.0

1000 s: (13.0...25.0) Spread cm3 : 6.00

1000 s: (10.00)

Remarks:

:

Note remarks

Test sheet : CUM 5,9 w 2 Edition : 21.09.92 Replaces : 05.92 Test oil : ISO-4113

Combination no. : 0 402 736 811

Injection pump

Pump designation : PES6P110A12DRS7213 EP type number : 0 412 716 804

Governor

Governor design. : RQV400...1250PA964

-3K

: 0 421 815 255 Governer no.

Customer-spec. information Customer : C.D.C.

Engine : 6BTA-A

1st version kW : 147.0 Rated speed : 2500

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 115...125

Test nozzle holder

: 1 688 901 101 assembly

Opening.

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 008

Outside diameter x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 22...24

: 4.35...4.45 Prestroke mm

: (4.30...4.50) Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

Phasina : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1250

Rack travel in mm : 14.80...14.90

Del.quantity cm3/: 15.8...16.0

100 s: (15.5...16.3)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 400.0

Rack travel in mm : 5.5...5.7 Del.cuantity cm3/ : 3.2...3.8

100 s: (3.0...4.0)

Spread cm3 : 0.8100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 400

: 1.60...1.80 travel mm

2nd spead rpm : 600

: 2.80...3.30 travel mm

3rd speed : 1300 rpm

travel mm : 7.20...7.40

4th speed : 1500 rom

: 8.90...9.30 travel mm

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1250 Aneroid pressure h: 1200

: 158.5...160.5 1000 : (155.5...163.5) Del.quantity

: 5.00 Spread cm3

1000 : (9.00)

RATED SPEED

1st version Control Lever

position dégrees: 56...64

Testina:

1st rack travel in: 13.80

Speed rpm : 1290...1300 2nd rack travel in: 4.00

rpm : 1460...1490 Speed

4th rack travel in: 1600

Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever

position degrees: 12...20

Testing:

: 275 Speed rpm Minimum rack trave: 7.20

: 400 Speed non

Rack travel in mm : 5.50...5.70

CONSTANT REGULATION

Speed rpm : 325...520

TORQUE CONTROL

Dimension a mm

Torque control curve - 1st version

1st speed rpm : 1250

Rack travel in m: 14.80...14.90

2nd speed npm : 800

Rack travel in m: 13.20...13.40

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed : 1250 **man** hPa : 1200 Pressure

Rack travel mm : 14.80...14.90

Measurement

Speed 1/min: 1250

1st pressure hPa : -

Rack travel in m: 8.20...8.60

2nd pressure hPa : 410

Rack travel in m: 10.60...10.70

3rd pressure hPa : 755

Rack travel in m: 13.70...14.10

START CUT-OUT

Speed 1/min: 290 (300) FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200

Speed rpm : 800 bel.quantity cm3/: 156.5...162.5 1000 s: (153.5...165.5)

cm3 : 8.00 Spread

1000 s: (12.0)

Aneroid pressure h: -Speed rpm

Del.quantity cm3/: 90.0...54.0 1000 s: (88.0...96.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 13.80

Speed rpm : 1290...1300

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 135.0...175.0

1000 s: (130,0...180.0)

Rack travel in mm : 11.90...12.90

LOW IDLE

rpm : 400 Speed

Rack travel in mm: 5.50...5.70 Del.quantity cm3/: 32.0...38.0 1000 s: (30.0...40.0)

cm3 : 8.00 Spread

1000 s: (12.00)

Remarks:

Start-of-delivery mark 6° cam angle

after start of delivery cyl. 1

Note remarks

Test sheet : MAC 12,0 c3 : 08.10.92 Edition Replaces : 02.05.90 Test oil : ISO-4113

Combination no. : D 402 746 876

Injection pump

Pump designation : PES6P120A720RS7157

EP type number : 0 412 726 814

Governor

Governor design. : RQV325...850PA929-3K

Governer no. : 0 421 815 232

Customer-spec, information

Customer : MACK TRUCKS

: E7-300 4VH Engine

1st version kW : 220.0 Rated speed : 1750

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 2 417 413 011

Overflow

quantity min. 1/h: 160...170

Test nozzle holder

: 1 688 901 101 assembly

Openina

pressure, bar : 207...210

Orifice plate

diameter ma : 0,6

Test lines : 1 680 750 008

Outside diameter x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85 : (2.70...2.90)

Rack travel in mm: 10.50

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no.

BASIC SETTING

1st speed rpm: 850

Rack travel in mm : 12.20...12.30

Del.quantity cm3/: 20.4...20.6

100 s: (20.2...20.8)

Spread cm3 : 0.5

100 s: (0.9)

rpm : 325.0 2nd speed

Rack travel in mm: 4.7...4.9 Del.quantity cm3/: 4.0...4.6

100 s: (3.8...4.8)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325

: 1.20...1.40 travel mm

: 450 2nd speed rpm

: 2.80...3.20 travel mm

3rd speed rpm : 650

: 5.60...5.80 travel mm

4th speed rpm : 900

: 8.30...8.50 travel mm

rpm : 1100 5th speed

travel mm : 10.30...10.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 850 Aneroid pressure h: 1200

Del.quantity : 204.0...206.0

1000 : (202.0...208.0)

Spread : 5.00 cm3

1000 : (9.00)

### RATED SPEED

1st version Control Lever

position degrees: 51...59

Testing:

1st rack travel in: 11.20 Speed rpm : 890...900 2nd rack travel in: 4.00

Speed rpm : 1040...1070 4th rack travel in: 1150

Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever

position degrees: 7...15

Testing:

: 275 Speed MOM Minimum rack trave: 6.30 Speed : 325 (LDW

Rack travel in mm: 4.70...4.90

CONSTANT REGULATION

Speed rpm : 325...520

TORQUE CONTROL

Dimension a mm

Torque control curve - 1st version

1st speed rpm : 850

Rack travel in m: 12.20...12.30

2nd speed ווסמרו : 600

Rack travel in m: 12.50...12.70

3rd speed rpm : 500

Rack travel in m: 0.00...11.10

Aneroid/Altitude Compensator Test

1st version

Setting

: 600 Speed man Pressure hPa : 1200

: 12.50...12.70 Rack travel mm

Measurement

Speed 1/min: 600

1st pressure hPa : -

Rack travel in m: 7.70...8.10

2nd pressure hPa : 265

Rack travel in m: 9.00...9.10 3rd pressure hPa : 565

Rack travel in m: 11.20...11.60

START CUT-OUT

Speed 1/min: 275 (285)

G19

### FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200 : 600 Speed rpm

Del.quantity cm3/: 241.0...247.0 1000 s: (239.0...249.0)

Spread cm3 : 8.00

1000 s: (12.0)

Aneroid pressure h: 1200 Speed : 850 COM

Del.quantity cm3/: 159.0...161.0 \*

1000 s: (136.5...157.0)

Aneroid pressure h: -

: 400 Speed rpm

Del.quantity cm3/: 148.0...152.0 1000 s: (146.0...154.0)

#### BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.20

Speed rpm : 890...900

## STARTING FUEL DELIVERY

Speed : 100 rpm

Del.quantity cm3/: 180.0...220.0 1000 s: (170.0...230.0)

Rack travel in mm : 10.00...10.60

# LOW IDLE

Speed rpm : 325 Rack travel in mm : 4.70...4.90 Del.quantity cm3/: 40.0...46.D

1000 s: (38.0...48.0)

Spread cm3 : 8.00

1000 s: (12.00)

### Remarks:

: MACK # 313GC5185-P16

\* This test specification applies only to the engine/nozzle-and-holder assemblies on an injection-pump test bench: setting for test equipment, check value for engine equipment.

Note remarks

Test sheet : RVI 6,2 h Edition : 21.09.92

Replaces : 04.92 Test oil : ISO-4113

Combination no. : 0 402 746 883

Injection pump

Pump designation : PES6P110A320RS7198

EP type number : 0 412 716 802

Governor

Governor design. : RQV275...1250PA942K

Governer no. : 0 421 815 234

Customer-spec. information Customer : RVI

Engine : MIDRO6-06-26

1st version kW : 132.5 Rated speed : 2500

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 419 992 198

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

Opening

pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter x Wall thickness

x Length mm : 8.00x2.50x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.60...4.70 : (4.55...4.75)

Rack travel in mm : 12.50...13.50

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance + - \* : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 14.10...15.10 & maximum rack tra: 20.0...21.0 Difference ° CS : 2.50...4.00

BASIC SETTING

1st speed rpm: 1250

Rack travel in mm : 14.60...14.70

Del.quaratity cm3/: 15.7...15.9

100 s: (15.4...16.1)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 275.0
Rack travel in mm : 5.3...5.7

Del.quantity cm3/: 1.7...2.2 100 s: (1.4...2.4)

Spread cm3 : 0.4 100 s: (0.7)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1300

travel mm : 9.50...9.70 2nd speed rpm : 275

travel mm : 0.90...1.10

3rd speed rpm : 550

travel mm : 3.80...4.20 4th speed rpm : 1000

travel mm : 7.10...7.50

5th speed rpm : 1600

travel mm : 13.00...14.00

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

Speed rpm: 1385

Rack travel in mm : 12.30...14.90

FULL LOAD DELIV. AT FULL LOAD STOP

1st version Speed rpm : 1250 Aneroid pressure h: 1000 Del.quantity : 157.0...159.0 1000 : (154.5...161.5) : 4.00 Spread cm3 1000 : (7.50) Speed RATED SPEED 1st version Control Leven position degrees: 110...118 Testina: 1st rack travel in: 13.60 rpm : 1315...1325 2nd rack travel in: 4.00 rpm : 1475...1505 Speed 4th rack travel in: 1600 rom : 0.00...1.00Speed LOW IDLE 1 Control lever position degrees: 58...66 Testing: Speed rpm Minimum rack trave: 5.70 Speed rpm : 275 Rack travel in mm : 5.00...5.20 Speed CONSTANT REGULATION Spead rpm : 350...480 TORQUE CONTROL Dimension a mm : ? Torque control curve - 1st version 1st speed rpm : 1250 Rack travel in m: 14.60...14.70 nd speed rpm : 750
Rack travel in m: 13.70...13.90 2nd speed Speed 3rd speed rpm : 300 Rack travel in m: 12.90...13.30 Spread Aneroid/Altitude Compensator Test 1st version Settina Speed : 1250 LIDU Pressure hPa : 1000 Rack travel mm : 14.60...14.70 Measurement 1/min: 1250 Speed 1st pressure hPa : -

2nd pressure hPa : 360 Rack travel in m: 12.80...12.90 3rd pressure hPa : 220 Rack travel in m: 11.80...12.20 START CUT-OUT 1/min : 200 (220) FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1000 rpm : 750 Del.quantity cm3/: 125.0...129.0 1000 s: (122.0...132.0) Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/ : 67.0...69.0 1000 s: (64.5...71.5) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 13.60 rpm : 1315...1325 STARTING FUEL DELIVERY rpm : 100 Del.quantity cm3/: 85.0...115.0 1000 s: (81.0...119.0) LOW IDLE rpm : 275 Rack travel in mm : 4.90...5.30 Del.quantity cm3/: 17.0...22.0 1000 s: (14.5...24.5) cm3 : 4.501000 s: (7.50) Remarks: Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

Rack travel in m: 11.00...11.40

BOSCH INJ. PUMP TEST SPECIFICATIONS Test pressure, bar: 25...27 Note remarks : 5.20...5.30 Prestroke mm (5.15...5.35) Rack travel in mm : 9.00...12.00 Test sheet : LIE Edition : 26.06.92 Firing order : 1-5-3-6-2-4 Replaces Test oil : ISO-4113 Combination no. : 0 402 746 932A Phasina : 0-60-120-180-240-300 Phasing Injection pump Tolerance + - \* : 0.50 (G.75) Pump designation : PES6P120A720RS7258 EP type number : 0 412 726 862 BASIC SETTING Governor Governor design. : RQV300...1050PA1035 1st speed rpm: 1050 : 0 421 813 995 Governer no. Rack travel in mm : 13.40...13.50 Cust, part no. : 9274017 Del.quantity cm3/: 20.7...20.9 Customer-spec. information Customer : LIEBHERR 100 s: (20.4...21.2) Engine : D926Ti Spread cm3 : 0.51st version kW : 220.0 100 s: (0.9) Rated speed : 2100 2nd speed rpm : 350.0 TEST BENCH REQUIREMENTS Rack travel in mm: 6.5...7.1 Del.quantity cm3/: 3.0...3.6 Test oil 100 s: (2.7...3.9) inlet temp. °C : 38...42 Spread cm3 : 0.6100 s: (1.0) Overflow valve : 1 417 413 025 (B) Setting of injection pump with governor Inlet press., bar: 1.50 GUIDE SLEEVE TRAVEL Test nozzle holder 1st speed mpm : 350 : 1 688 901 105 assembly travel mm : 1.70...2.20 2nd speed rpm : 490 Opening : 3.30...3.80 travel mm : 207...210 pressure, bar 3rd speed : 780 rpm travel mm : 6.30...6.80 Orifice plate 4th speed : 1120 rpm diameter mm : 0,8 10.30...10.80 travel mm 5th speed : 1320 rom : 13.00...14.00 travel mm Test lines : 1 680 750 075 GUIDE SLEEVE POSITION Outside diameter Control-lever position x Wall thickness Degree: -1 : 8.00X2.50X1000 x Length mm Speed rpm : 1150

Rack travel in mm : 11.50...14.10

FULL LOAD DELIV. AT FULL LOAD STOP

Aneroid pressure h: 1500

rpm : 1050

1st version

Speed

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY

Del.quantity : 207.0...209.0 1000 : (204.0...212.0)

: 5.00 Spread cm3 1000 : (9.00)

RATED SPEED

1st version Control lever

position degrees: 102...110

Testing:

1st rack travel in: 12.50

Speed rpm : 1100...1110 2nd rack travel in: 4.00

rpm : 1180...1210 Speed

4th rack travel in: 1300

rpm : 0.00...1.40 Speed

LOW IDLE 1 Control lever

position degrees: 68...76

Testing:

Speed : 250 rpm Minimum rack trave: 10.00 rpm : 350

Rack travel in mm : 6.70...6.90

Rack travel in mm: 2.00 Speed : 430...490 rom

CONSTANT REGULATION

Speed rpm : 350...450

Aneroid/Altitude Compensator Test

1st version Setting

Speed rpm : 700 hPa : 1500 Pressure

Rack travel mm : 13.40...13.50

Measurement

1/min: 700 Speed

1st pressure hPa : -

Rack travel in m: 10.50...10.70

2nd pressure hPa : 1050 Rack travel in m: 12.70...12.80

3rd pressure hPa : 720

Rack travel in m: 11.20...11.40

START CUT-OUT

Speed 1/min: 270 (290)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -: 700 Speed

rpm

Del.quantity cm3/: 154.0...156.0 1000 s: (151.0...159.0)

cm3 : 8.00 Spread

1000 s: (12.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 12.50

Speed rpm : 1100...1110

STARTING FUEL DELIVERY

Speed : 100 ripm

Del.quantity cm3/: 175.0...195.0

1000 s: (171.0...199.0)

Remarks:

G23

Note remarks

Test sheet

Edition

: PER : 05.10.92

Replaces

Test oil

: ISO-4113

Combination no. : 0 402 746 934

Injection pump

Pump designation : PES6P120A320RS7256

EP type number

: 0 412 726 879

Governor

Governor design: RQV250...950PA793-3

Governer no.

: 0 421 814 014

Customer-spec, information

Customer

: PERKINS

Engine

: EAGLE TX 375/400

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly

: 1 688 901 019

Open inu

pressure, bar

: 207...210

Orifice plate

diameter mm

: 0,8

Test lines

: 1 680 750 075

Outside diameter

x Wall thickness

x Length mm

: 8.00x2.50x1000

(A) Injection pump setting values

Insp. values in parentheses

Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 4.50...4.60

: (4.45...4.65)

Rack travel in mm : 12.00...13.00

Firing order : 1-4-2-6-3-5

Phasing

: 0-60-120-180-240-300

Tolerance + - °

: 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed

rpm: 900

Rack travel in mm : 12.20...12.30

Del.quantity cm3/: 26.2...26.4

100 s: (25.9...26.7)

Spread

cm3 : 0.6

100 s: (0.9)

2nd speed

rpm : 250.0

Rack travel in mm: 5.9...6.1

Del.quantity cm3/: 1.3...1.7 100 s: (1.0...2.9)

cm3 : 0.8

Spread 100 s: (1.2)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

1st speed

rpm : 250

travel mm

: 0.90...1.40 rpm : 315

2nd speed travel mm

: 1.70...2.20

3rd speed

rpm : 670

travel mm

: 3.90...4.40

4th speed

rpm : 985

travel mm 5th speed travel rm

: 7.60...7.80 rpm : 1250

: 11.00...12.00

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1115

Rack travel in mm : 10.00...12.60

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

rom : 900

Aneroid pressure h: 1200

Del.quantity : 202.0...267.0)

Spread cm3 : 6.00 1000 : (9.00)

RATED SPEED

1st version Control lever

position degrees: 113...121

Testina:

1st rack travel in: 11.30 Speed rpm : 980...990 2nd rack travel in: 4.00

Speed rpm : 1055...1085 4th rack travel in: 1200

rpm : 0.00...1.00Speed

LOW IDLE 1 Control lever

position degrees: 80...88

Testing:

Speed rpm : 100 Minimum rack trave: 7.50 Speed rpm

Rack travel in mm : 5.90...6.10

CONSTANT REGULATION

Speed rpm : 250...450

Aneroid/Altitude Compensator Test

1st version Setting

Speed rom : 600 hPa : 1200 Pressure

: 12.20...12.30 Rack travel mm

Measurement

1/min : 600 Speed

1st pressure hPa : -

Rack travel in m: 8.20...8.40

2nd pressure hPa : 515
Rack travel in m: 11.10...11.20
3rd pressure hPa : 300
Rack travel in m: 9.10...9.30

START CUT-OUT

1/min : 170 (190) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -Speed rpm : 600 Del.quantity cm3/: 142.0...144.0 1000 s: (139.0...147.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.30 Speed rpm : 980...990

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 190.0...230.0

1000 s: (187.0...233.0)

Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 250 Rack travel in mm : 5.90...6.10

Remarks:

Delivery-valve spring pre-tension 3.2...3.4 mm.

Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring preload on new delivery-valve holders to 2.9...3.1 mm.

Note remarks

Test sheet : MB

Edition : 05.10.92

Replaces : -

Test oil : ISO-4113

Combination no. : 0 402 746 936

Injection pump

Pump designation : PES6P120A720LS7238

-10

EP type number : 0 412 726 873

Governor

Governor design. : R0300/1100PA1044

Governer no. : 0 421 801 670

Customer spec. information

Customer : MERCEDES-BENZ

Engine : OM447 hLA

1st version kW : 220.0 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil

inlet temp. \*C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

assembly : 1 688 901 105

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter

x Wall thickness

x Length mm : 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60

: (5.45...5.65)

Rack travel in mm : 20.00...21.00

Firing order : 6-2-4-1-5-3

Phasing : 0-60-120-180-240-300

Tolerance  $+ - ^{\circ} : 0.50 (0.75)$ 

Time to cyl. no. : 6

BASIC SETTING

Spread

1st speed rpm: 1100

Rack travel in mm : 14.50...14.60

Del.quantity cm3/: 22.0...22.2

100 s: (21.7...22.5)

cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 6.2...6.8

Del.quantity cm3/: 1.6...2.2 100 s: (1.3...2.5)

Spread cm3 : 0.8

100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position Degree: -2

peed rpm : 650

Rack travel in mm: 19.20...20.80

Mack travet in min : 19.20...20.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Spread

Speed rpm: 1100

Aneroid pressure h: 1000

Del.quantity : 220.0...222.0 1000 : (217.0...225.0)

cm3 : 5.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 650

Rack travel in mm: 20.0 Testing: 1st rack travel in: 13.50 rpm : 1145...1160 Speed 2nd rack travel in: 4.00 rpm : 1215...1245 Speed 4th rack travel in: 1300 Speed rpm : 0.00...1.50LOW IDLE 1 Setting point w/out bumper spring rpm : 300 Rack travel in mm: 6.5 Testing: Speed rpm : 200 Minimum rack trave: 9.20 rpm : 300 Rack travel in mm : 6.40...6.60 Rack travel in mm : 2.00 rpm : 370...410 Speed TORQUE CONTROL Dimension a mm :? Torque control curve - 1st version 1st speed rpm : 1100 Rack travel in m: 14.50...14.60 2nd speed rpm : 550 Rack travel in m: 15.40...15.60 Aneroid/Altitude Compensator Test 1st version Setting : 500 Speed rom hPa : Pressure : 11.00...11.20 Rack travel mm Measurement  $1/\min : 500$ Speed 1st pressure hPa : 200 Rack travel in m: 11.70...11.80 2nd pressure hPa : 550 Rac. travel in m: 13.90...14.10 3rd pressure hPa : 1000 Rack travel in m: 14.70...14.80 FUEL DELIVERY CHARACTERISTICS 1st version

cm3 : 8.00Spread 1000 s: (12.0) Aneroid pressure h: rpm : 500 Speed Del.quantity cm3/: 142.0...144.0 1000 s: (139.0...147.0) cm3 : 8.00Spread 1000 s: (12.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 13.50 rpm : 1145...1160 Speed Remarks: :

Aneroid pressure h: 1000

Speed rpm : 550
Del.quantity cm3/: 237.0...241.0

1000 s: (234.0...244.0)

### Note remarks

Test sheet : MAC Edition : 21.09.92 : 07.92 Replaces Test oil : ISO-4113

Combination no. : 0 402 748 807

Injection pump

Pump designation: PES8P120A920/4LS7246

EP type number : 0 412 728 805

Governor

: RQV325...1000PA1018 Governor design.

-1K

Governer no. : 0 421 815 292

Customer-spec. information Customer : MACK

Engine : EE9 530

1st version kW : 395.0 : 2000 Rated speed

# TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 2 417 413 011

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 160...170

Test nozzle holder

: 1 688 901 103 assembly

Opening .

pressure, bar : 207...210

Orifice plate

diameter mm : 0,7

Test lines : 1 680 750 008

Outside diameter x Wall thickness

x Length mm : 6,09x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 2.75...2.85

: (2.70...2.90) Rack travel in mm : 12.00...14.00

: 1-2-7-8-4-5-6-3 Firing order

Phasina : 0-45-90-135-180-225-

270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

# BASIC SETTING

1st speed rpm: 500

Rack travel in mm : 13.60...13.70

Del.quantity cm3/: 29.3...29.5

100 s: (29.0...29.8)

Spread cm3 : 0.6

100 s: (1.0)

rpm : 325.0 2nd speed Rack travel in mm: 5.6...5.8

Del.quantity cm3/ : 2.4...3.0 100 s: (2.1...3.3)

Spread cm3 : 0.8100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325

travel mm : 1.30...1.60 2nd speed rpm : 450

travel mm : 2.80...3.20 3rd speed rpm : 900

travel mm : 7.50...7.90

4th speed : 1050 rom

: 8.90...9.10 travel mm

: 1300 5th speed rpm travel mm : 11.50...11.90

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1240 Speed

Rack travel in mm : 7.00...13.00

FULL LOAD DELIV. AT FULL LOAD STOP Speed 1/min: 1000 1st version 1st pressure hPa : -Speed Rack travel in m: 9.90...10.30 : 500 COM Aneroid pressure h: 1200 2nd pressure hPa : 235 Del.quantity : 293.0...295.0 Rack travel in m: 11.30...11.40 1000 : (290.0...298.0) 3rd pressure hPa : 610 Spread : 6.00 Rack travel in m: 14.40...14.80 cm31000 : (10.00) START CUT-OUT RATED SPEED 1/min: 280 (290) Speed 1st version Control lever FUEL DELIVERY CHARACTERISTICS position degrees: 62...70 Testina: 1st version 1st rack travel in: 15.30 Aneroid pressure h: 1200 rom : 1055...1065 Speed Speed : 1000 rpm 2nd rack travel in: 4.00 Del.quantity cm3/: 306.5...312.5 1000 s: (303.5...315.5) rpm : 1235...1265 Speed 4th rack travel in: 1350 Spread cm3 : 10.00Speed rpm : 0.00...1.001000 s: (14.0) Aneroid pressure h: -LOW IDLE 1 Speed rpm : 400 Det.quantity cm3/: 184.5...188.5 Control lever position degrees: 10...18 1000 s: (181.5...191.5) Testing: Speed : 275 rpm BREAKAWAY Minimum rack trave: 1.00 : 325 Speed rom 1st version Rack travel in mm : 5.60...5.80 1mm rack travel less than CONSTANT REGULATION full load rack tr: 15.30 rpm : 325...600 Speed rpm : 1055...1065 Speed TORQUE CONTROL STARTING FUEL DELIVERY Dimension a mm : ? Torque control curve - 1st version nom : 500 1st speed : 100 Speed rpm Rack travel in m: 13.60...13.70 Del.quantity cm3/: 160.0...200.0 : 1000 2nd speed rpm 1000 s: (156.0...204.0) Rack travel in m: 16.30...16.50 Rack travel in mm : 11.00...12.00 : 700 3rd speed rpm Rack travel in m: 14.10...14.50 LOW IDLE : 400 4th speed rom Rack travel in m: 13.20...13.60 rpm : 325 Speed Rack travel in mm : 5.60...5.80 Del.quantity cm3/ : 24.0...30.0 Aneroid/Altitude Compensator Test 1000 s: (21.0...33.0) Spread cm3 : 8.00 1000 s: (12.00) 1st version Setting Remarks: Speed : 1000 nom Pressure hPa : 1200 : 16.30...16.50 Rack travel mm Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 Measurement start of delivery

H01

Bow dimension:
Sliding-sleeve position = 37.0 mm
\* This test specification applies only
to the engine/nozzle-and-holder
assemblies on an injection-pump test
bench: setting for test equipment,
check value for engine equipment.

BOSCH INJ. PUMP TEST SPECIFICATIONS Firing order : 1-5-3-6-2-4 Note remarks Test sheet Phasing : 0-60-120-180-240-300 : 21.08.92 Edition Replaces : 07.92 Tolerance + - \* : 0.50 (0.75) Test oil : ISO-4113 BASIC SETTING Combination no. : 0 403 246 033 1st speed rpm : 1300Injection pump Pump designation : PES6MW100/720RS1511 Rack travel in mm : 12.60...12.70 EP type number : 0 413 206 011 Sovemor Del.quantity cn3/: 11.8...12.0 Governor design. : RQV300...1300MW125-6 Governer no. : 0 420 083 286 100 s: (11.6...12.2) Customer-spec. information Spread cm3 : 0.3Customer : MERCEDES-BENZ 100 s: (0.6) Engine : 0M366LA 2nd speed rpm : 300.01st version kW : 156.0 Rack travel in mm: 4.1...4.3 : 2600 Rated speed Del.quantity cm3/: 1.0...1.4 100 s: (0.7...1.6) TEST BENCH REQUIREMENTS Spread cm3 : 0.3100 s: (0.5) Test oil inlet temp. °C : 38...42 (B) Setting of injection pump with governor Overflow valve : 1 419 992 198 GUIDE SLEEVE TRAVEL 1st speed rpm : 1350 Inlet press., bar: 1.50 travel mm : 8.60...9.00 rpm : 880 2nd speed Test nozzle holder travel mm : 4.90...5.10 : 0 681 343 009 assembly 3rd speed rpm : 500 : 2.70...3.30 travel mm rpm : 300 Opening 4th speed pressure, bar : 172...175 travel mm : 1.20...1.60 FULL LOAD DELIV. AT FULL LOAD STOP Test lines : 1 680 750 D89 1st version Outside diamete. Speed rpm : 1300 x Wall thickness Aneroid pressure h: 1400 : 118.0...120.0 1000 : (116.0...122.0) x Length mm : 8.00x2.50x600 Del.quantity (A) Injection pump setting values Spread cm3 : 3.50 Insp. values in parentheses 1000 : (6.00) Set equal delivery quant.

per values \_\_\_\_ + RATED SPEED | RATED SPEED SP

Control lever

Testing:

position degrees: 118...126

1st rack travel in: 11.60

BEGINNING OF DELIVERY
Test pressure, bar: 30...32

Prestroke mm : 5.20...5.30 : (5.15...5.35)

Rack travel in mm : 21.00...0.00

HO3

rpm : 1340...1350 Speed

2nd rack travel in: 4.00

Speed rpm : 1455...1485 4th rack travel in: 1550

Speed rpm : 0.00...1.00

LOW IDLE 1 Control Lever

position degrees: 61...69

Testina:

Speed : 200 rpm Minimum rack trave: 5.00 Speed rpm : 300

Rack travel in mm : 4.10...4.30

Aneroid/Altitude Compensator Test

1st version

Setting

Speed : 500 rpm Pressure hPa : -

Rack travel mm : 6.60...6.80

Measurement

1/min : 500Speed

1st pressure hPa : 300

Rack travel in m: 7.20...7.40

2nd pressure hPa : 900

Rack travel in m: 11.90...12.10

3rd pressure hPa : 1400

Rack travel in m: 12.60...12.70

START CUT-OUT

1/min: 220 (240) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1400 : 750 Speed rpm

Del.quantity cm3/: 111.5...114.5 1000 s: (109.0...117.0)

cm3 : 5.00Spread

1000 s: (7.00)

Aneroid pressure h: -: 500 Speed ripm

Del.quantity cm3/: 35.0...37.0

1000 s: (33.0...39.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.60

Speed rpm : 1340...1350

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quantity cm3/: 115.0...125.0 1000 s: (112.0...128.0)

LOW IDLE

Speed : 300 rpm

Rack travel in mm : 4.10...4.30 Del.quantity cm3/: 10.0...14.0

1000 s: (7.5...16.5)

Spread cm3 : 3.50

1000 s: (5.50)

Remarks:

H04

Note remarks

Test sheet : PER

Edition : 21.09.92

Replaces

Test oil : ISO-4113

Combination no. : 0 403 436 114

Injection pump

Pump designation : PES6MW100/320/3RS119

4-1

EP type number

: 0 413 406 221

Governor

Governor design. : RQV300...1300MW108K

Governer no. : 0 420 083 998 .

Customer-spec. information Customer : PERKINS

Engine : 180 TI

1st version kW : 134.0 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 419 992 198

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 101 assembly

Opening.

pressure, bar : 207...210

Orifice plate

diameter mm : 0.6

Test lines : 1 680 750 008

Outside diameter

x Wall thickness

x Length mm : 6.00X2.00X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.30...3.40

: (3.25...3.45) Rack travel in mm : 12.00...14.00

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1300

Rack travel in mm : 14.30...14.40

Del.quantity cm3/: 13.4...13.6

100 s: (13.2...13.8)

cm3 : 0.3Spread

100 s: (0.6)

2nd speed rpm : 300.0Rack travel in mm: 6.1...6.3 Del.quantity cm3/: 1.4...1.8 100 s: (1.1...2.0)

cm3 : 0.3Spread 100 s: (0.5)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1350

10.00...10.40 travel mm

2nd speed rpm : 900

travel mm : 6.40...6.60

3rd speed : 480 rpm

travel mm : 3.10...3.70

4th speed rpm : 300

: 1.40...1.30 travel min

GUIDE SLEEVE POSITION Control-lever position

Degree: -1 rpm : 1380 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1300 Speed Aneroid pressure h: 900

Del.quantity : 134.0...136.0 Rack travel in m: 10.40...10.50 1000 : (132.0...138.0) 2nd pressure hPa : 220 : 3.50 Spread cm3Rack travel in m: 10.90...11.20 1000 : (6.00)3rd pressure hPa : 900 Rack travel in m: 11.70...11.90 RATED SPEED START CUT-OUT 1st version Control Lever Speed 1/min : 240 (250) position degrees: 118...126 FUEL DELIVERY CHARACTERISTICS Testing: 1st rack travel in: 13.30 rpm : 1340...1350 Speed 1st version 2nd rack travel in: 4.00 Aneroid pressure h: 900 rpm : 1480...1510 Speed : 800 Speed rom Del.quantity cm3/: 126.0...129.0 1000 s: (123.5...131.5) 4th rack travel in: 1600 rpm : 0.00...1.00 Speed cm3 : 5.00Spread LOW IDLE 1 1000 s: (7.00) Control Lever Aneroid pressure h: 900 position degrees: 70...78 : 500 Speed rpm Del.quantity cm3/: 107.5...110.5 Testing: 1000 s: (105.0...113.0) Speed rpm : 200 Ameroid pressure h: -Speed rpm : 500 Del.quantity cm3/ : 61.0...63.0 1000 s: (59.0...65.0) Minimum rack trave: 7.50 Speed rpm : 300 Rack travel in mm: 6.10...6.30 CONSTANT REGULATION rpn : 330...500 Speed BREAKAWAY TORQUE CONTROL 1st version Dimension a mm : 2.60 1mm rack travel less than Torque control curve - 1st version 1st speed rpm : 1300 full load rack tr: 13.30 Rack travel in m: 14.30...14.40 rpm : 1340...1350 Speed : 800 2nd speed rpm Rack travel in m: 13.10...13.30 STARTING FUEL DELIVERY 3rd speed : 500 rpm Rack travel in m: 11.70...11.90 4th speed : 1000 rpm Speed : 100 rpm Del.quantity cm3/: 78.0...92.0 1000 s: (75.0...95.0) Rack travel in m: 13.60...13.90 : 700 5th speed rom Rack travel in m: 12.60...12.90 Rack travel in mm : 19.00...21.00 Aneroid/Altitude LOW IDLE Compensator Test Speed : 300 rpm Rack travel in mm : 6.10...6.30 1st version Del.quantity cm3/: 14.0...18.0 Settina 1000 s: (11.5...20.5) : 500 Speed rpm Spread cm3 : 3.50Pressure hPa : -1000 s: (5.50) : 9.20...9.40 Rack travel mm Remarks: Measurement 1/min: 500 Speed

1st pressure hPa : 180

H06

Note remarks

Test sheet

Replaces

Test oil

Combination no. : 0 403 444 113A

Injection pump

Pump designation : PES4MW100/720RS1151

EP type number : 0 413 404 104

Governor

Governor design.: RQV300...1300MW50-3

: 0 420 083 129 Governer no.

Customer-spec. information

Customer : MERCEDES-BENZ

Engine : OM 364 LA

1st version kW : 85.0 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 419 992 198

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening

: 172...175 pressure, bar

Test lines : 1 680 750 089

Outside diameter x Wall thickness

x Length mm : 8.00x2.50x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80

: (3.65...3.85)

Rack travel in mm : 9.00...12.00

: MB Edition : 21.08.92

: ISO-4113

1st speed

BASIC SETTING

Phasina

rpm: 1300

Firing order

Tolerance + - °

Rack travel in mm : 10.70...10.80

Del.quantity cm3/: 8.0...8.2

100 s: (7.8...8.4)

: 1-3-4-2

: 0-90-180-270

: 0.50 (0.75)

Spread cm3 : 0.3

100 s: (0.6)

rpm : 300.02nd speed Rack travel in mm: 6.8...6.9

Del.quantity cm3/: 1.0...1.4 100 s: (0.7...1.6)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 1340 1st speed

: 8.50...8.70 travel mm 2nd speed mpm : 1450

: 9.50...9.90 travel mm

rpm : 500 3rd speed : 2.70...3.30 travel mm

4th speed rpm : 300

travel mm : 1.30...1.70

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1340

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300 Aneroid pressure h: 700

Del.quantity : 80.0...82.0

1000 : (78.0...84.0)

: 3.50 Spread cm3 1000 : (6.00)

RATED SPEED

H07

1st version Control lever

position degrees: 99...107

Testing:

1st rack travel in: 10.70

rpm : 1340...1350 Speed

2nd rack travel in: 4.00

rpm : 1445...1475 Speed

4th rack travel in: 1550

rpm : 0.00...1.00 Speed

LOW IDLE 1 Control Lever

position degrees: 72...80

Testing:

Speed : 200 COM Minimum rack trave: 8.40 : 300 Speed POR

Rack travel in mm : 6.80...6.90

CONSTANT REGULATION

rpm : 320...550 Speed

TORQUE CONTROL

Dimension a mm : 0.90

Torque control curve - 1st version

1st speed rpm : 1300

Rack travel in m: 10.70...10.80

2nd speed rpm : 750 Rack travel in m: 11.60...11.80

3rd speed rpm : 1175 Rack travel in m: 11.00...11.40

Aneroid/Altitude Compensator Test

1st version

Setting

Speed : 500 COM Pressure hPa :

: 10.00...10.20 Rack travel mm

Measurement

Speed 1/min: 500

1st pressure hPa : 300

Rack travel in m: 11.00...11.20

3rd pressure hPa : 700

Rack travel in m: 11.60...11.80

START CUT-OUT

1/min: 220 (250) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700

Speed rpm : 750
Del.quantity cm3/ : 75.5...78.5
1000 s: (73.0...81.0)

cm3 : 5.00 Spread

1000 s: (7.00)

Aneroid pressure h: rpm : 500 Speed

Del.quantity cm3/: 46.0...48.0

1000 s: (44.0...50.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 10.70

Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed : 100 (Ppm

Del.quantity cm3/: 85.0...95.0

1000 s: (82.0...98.0)

LOW IDLE

rpm : 300 Speed

Rack travel in mm : 6.80...6.90

Del.quantity cm3/: 10.0...14.0

1000 s: (7.5...16.5) cm3 : 3.50

1000 s: (5.50)

Remarks:

Spread

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : MB : 21.08.92 Edition Reptaces : 06.92 Test oil : ISO-4113 Combination no. : 0 403 444 139 Injection pump Pump designation : PES4MW100/720RS1151 EP type number : 0 413 404 104 Governor Governor design. : RQV300...1300MW67-7 : 0 420 083 278 Governer no. Customer-spec. information Customer : MERCEDES-BENZ Engine : 0M364A 1st version kW : 79.0 Rated speed : 2600 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 047 Inlet press., bar: 1.50 Test nozzle holder assembly : 0 681 343 009 Opening pressure, bar : 172...175 Test Lines : 1 680 750 015 Outside diameter x Wall thickness : 6.00x1.50x600 x Length mm (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

: 1-3-4-2 firing order Phasing : 0-90-180-270 Tolerance + - ° : 0.50 (0.75) BASIC SETTING 1st speed rpm: 1300 Rack travel in mm: 10.80...10.90 Del.quantity cm3/: 8.2...8.4 100 s: (8.0...8.6) Spread cm3 : 0.3100 s: (0.6) rpm : 300.02nd speed Rack travel in mm: 6.3...6.5 Del.quantity cm3/: 1.0...1.4 100 s: (0.7...1.6) cm3 : 0.3Spread 100 s: (0.5) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL 1st speed rpm : 1350 travel mm : 8.40...8.80 2nd speed rom : 880 : 4.90...5.10 travel mm 3rd speed rpm : 500 : 2.70...3.30 travel mm rpm : 300 4th speed : 1.20...1.60 travel ma GUIDE SLEEVE POSITION Control-lever position Degree: -1 rpm : 1350 Rack travel in mm : 15.20...17.80 FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 1300 Aneroid pressure h: 700 Del.quantity : 82.0...84.0 1000 : (80.0...86.0) Spread : 3.50 cm3 1000 : (6.00)

RATED SPEED

H09

BEGINNING OF DELIVERY

Prestroke mm

Test pressure, bar: 30...32

Rack travel in mm : 9.00...12.00

: 3.70...3.80 : (3.65...3.85)

1st version Control Lever position degrees: 108...116 Setting point: Speed Rack travel in mm: 16.5 Testing: 1st rack travel in: 9.80 rpm : 1340...1350 Speed 2nd rack travel in: 4.00 : 1420...1450 Speed rpm 4th rack travel in: 1500 Speed rpm : 0.00...1.00LOW IDLE 1 Control lever position degrees: 74...82 Testing: Speed : 200 rpm Minimum rack trave: 8.00 : 300 Speed rpm Rack travel in mm : 6.30...6.50 Rack travel in mm: 2.00 Speed rpm : 480...540 TORQUE CONTROL Dimension a mm : 0.80 Torque control curve - 1st version 1st speed rpm : 1300 Rack travel in m: 10.80...10.90 2nd speed rpm : 600 Rack travel in m: 11.60...11.70 rpm : 1000 3rd speed Rack travel in m: 11.60...11.70 4th speed rpm : 1175 Rack travel in m: 11.30...11.50 Anaroid/Altitude Compensator Test 1st version Settina Speed rpm : 500 : 9.70...9.80 Rack travel mm Measurement Speed 1/min: 500 1st pressure hPa : 150 Rack travel in m: 10.30...10.50 2nd pressure hPa : 300 Rack travel in m: 11.30...11.50 3rd pressure hPa : 700 Rack travel in m: 11.60...11.70

1/min : 200 (230) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 700 : 600 rpm Del.quantity cm3/: 75.0...78.0 1000 s: (72.5...80.5) Spread cm3 : 5.001000 s: (7.00) Ameroid pressure h: -Ameroid pressure h: rpm : 500 Speed Del.quantity cm3/: 46.0...48.0 1000 s: (44.0...50.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 9.80 Speed rpm : 1340...1350 STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/ : 78.0...88.0 1000 s: (75.0...91.0) LOW IDLE Speed rpm Rack travel in mm : 6.30...6.50 Del.quantity cm3/: 10.0...14.0 1000 s: (7.5...16.5) cm3 : 3.50 Spread 1000 s: (5.50) Remarks:

START CUT-OUT

BOSCH INJ. PUMP TEST SPECIFICATIONS Test pressure, bar: 30...32 : 3.25...3.35 : (3.20...3.40) Note remarks Prestroke mm Test sheet Rack travel in mm : 9.00...12.00 : IHC Edition : 21.08.92 Firing order : 1-5-3-6-2-4 Replaces Test oil : ISO-4113 Combination no. : 0 403 446 239AA Phasing : 0-60-120-180-240-300 Phasing Injection pump Tolerance + - ° : 0.50 (0.75) Pump designation : PES6MW100/320RS1189 : 0 413 406 177 EF type number Time to cyl. no. : i Governor Governor design. : RQV350...1200MW46-21 BASIC SETTING : 0 420 083 201 Governer no. 1st speed rom: 1200 Cust. part no. : 1819901c91 Rack travel in mm : 12.50...12.60 Customer-spec. information Customer : NAVISTAR Del.quantity cm3/: 13.0...13.4 Engine : DTA-466 100 s: (12.8...13.6) 1st version kW : 186.0 Spread cm3 : 0.3Rated speed : 2400 100 s: (0.6) TEST BENCH REQUIREMENTS 2nd speed rpm : 350.0 Test oil Rack travel in mm: 5.3...5.5 inlet temp. °C : 38...42 Del.quantity cm3/: 1.6...2.0 100 s: (1.3...2.2) Overflow valve Spread cm3 : 0.3: 2 417 413 038 100 s: (0.5) Inlet press., bar: 2.80 (B) Setting of injection pump with governor Test nozzle holder : 1 688 901 101 assembly GUIDE SLEEVE TRAVEL rpm : 1450 1st speed Opening : 9.80...10.20 travel mm pressure, bar : 207...210 : 1250 2nd speed man. travel mm : 7.90...8.10 Orifice plate 3rd speed : 550 rpm diameter mm : 3.10...3.70 : 0.6 travel mm 4th speed 350 rpm 1.30...1.70 travel mm Test lines : 1 680 750 008 FULL LOAD DELIV. AT FULL LOAD STOP Outside diameter x Wall thickness 1st version : 6.00X2.00X600 x Length mm Speed rpm : 1200 Aneroid pressure h: 1200

: 130.0...134.0

1000 : (128.0...136.0)

: 3.50

1000 : (6.00)

cm3

RATED SPEED

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values \_\_\_\_\_\_

BEGINNING OF DELIVERY

1st version Control lever

position degrees: 104...112

Testing:

1st rack travel in: 11.50

rpm : 1270...1290 Speed

2nd rack travel in: 4.00

Speed rpm : 1400...1410

4th rack travel in: 1550

Speed rpm : 0.00...1.00

LOW IDLE 1 Control lever

position degrees: 68...76

Testina:

rpm : 100 Speed Minimum rack trave: 9.00 rpm : 350 Speed

Rack travel in mm : 5.30...5.50

CONSTANT REGULATION

rpm : 300...450 Speed

Aneroid/Altitude Compensator Test

1st version

Setting

Speed rom : 500 hPa : Pressure

: 9.00...9.10 Rack travel mm

Measurement

1/min : 500 Speed

1st pressure hPa : 335

Rack travel in m: 10.00...10.10

2nd pressure hPa : 645

Rack travel in m: 11.40...11.80

3rd pressure hPa : 1200 Rack travel in m: 12.50...12.60

START CUT-OUT

1/min : 280 (290) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200 rpm : 800

Del.quantity cm3/: 133.5...135.5

1000 s: (131.5...137.5)

Spread cm3 : 6.50

1000 s: (7.00)

Aneroid pressure h: -

rpm : 500 Speed Del.quantity cm3/: 68.0...70.0

1000 s: (66.0...72.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.50

Speed rpm : 1270...1290

STARTING FUEL DELIVERY

Speed rpm : 100

Speed rpm : 100 Del.quantity cm3/ : 150.0...190.0 1000 s: (147.0...193.0)

Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 350

Rack travel in mm : 5.30...5.50 Del.quantity cm3/: 16.0...20.0

1000 s: (13.5...22.5)

Spread cm3 : 3.50

1000 s: (5.50)

Remarks:

Set shutoff stop 1.5...2.0 mm before

shutoff.

BOSCH INJ. PUMP TEST SPECIFICATIONS Test pressure, bar: 30...32 Note remarks : 3.25...3.35 Prestroke mm : (3.20...3.40) Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4 Test sheet : IHC Edition : 21.08.92 Replaces Test oil : ISO-4113 Combination no. : 0 403 446 254BA Phasing : 0-60-120-180-240-300 Phasing Tolerance + - ° Injection pump : 0.50 (0.75) Pump designation : PES6MW100/320RS1189 : 0 413 406 177 EP type runber Time to cyl. no. : 1 Governor Governor design. : RQV350...1200MW46-29 BASIC SETTING Governer no. : 0 420 083 217 1st speed rpm: 1200 Cust. part no. : 1819902091 Rack travel in mm : 12.50...12.60 Customer—spec. information Customer : NAVISTAR Del.quantity cm3/: 13.0...13.4 Engine : DTA-466 100 s: (12.8...13.6) : 186.0 1st version kW Spread cm3 : 0.3Rated speed : 2400 100 s: (0.6) TEST BENCH REQUIREMENTS 2nd speed rpm : 350.0 Rack travel in mm : 5.3...5.5 Test oil inlet temp. \*C : 38...42 Del.quantity cm3/: 1.6...2.0 100 s: (1.3...2.2) Overflow valve cm3 : 0.3Spread : 2 417 413 038 100 s: (0.5) Inlet press., bar: 2.80 (B) Setting of injection pump with governor Test nozzle holder assembly : 1 688 901 101 GUIDE SLEEVE TRAVEL rpm : 1450 1st speed **Opening** : 9.80...10.20 travel mm : 207...210 pressure, bar rpm : 1250 2nd speed travel mm : 7.90...8.10 Orifice plate rpm : 550 3rd speed diameter man : 0,6 travel ma rpm : 350 4th speed travel mm Test lines : 1 680 750 008 Outside diameter x Wall thickness 1st version x Length mm : 6.00x2.00x600 Speed (A) Injection pump setting values Del.quantity Insp. values in parentheses Set equal delivery quant.

: 3.10...3.70 : 1.30...1.70 FULL LOAD DELIV. AT FULL LOAD STOP rpm : 1200 Aneroid pressure h: 1200 : 130.0...134.0 1000 : (128.0...136.0) : 3.50 Spread cm3 1000 : (6.00) RATED SPEED

per values

BEGINNING OF DELIVERY

1st version Control Lever

position degrees: 104...112

Testina:

1st rack travel in: 11.50

rpm : 1270...1290 Speed

2nd rack travel in: 4.00

Speed rpm : 1400...1410 4th rack travel in: 1550

rom : 0.00...1.00Speed

LOW IDLE 1

Control Lever

position degrees: 68...76

Setting point w/out bumper spring

Speed rpm : 350 Rack travel in mm: 5.4

Testina:

Speed rpm : 100 Minimum rack trave: 9.00 Speed : 350 man

CONSTANT REGULATION

rpm : 300...450 Speed

Aneroid/Altitude Compensator Test

1st version

Setting

: 500 Speed LOU Pressure hPa :

: 9.00...9.10 Rack travel mm

Measurement

Speed 1/min: 500

1st pressure hPa : 335

Rack travel in m: 10.00...10.10

2nd pressure hPa : 645

Rack travel in m: 11.40...11.80

3rd pressure hPa : 1200

Rack travel in m: 12.50...12.60

START CUT-OUT

1/min : 280 (290) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200

rpm : 800 Speed

Del.quantity cm3/: 133.5...135.5 1000 s: (131.5...137.5)

Spread cm3 : 6.50

1000 s: (7.00)

Aneroid pressure h: -

Speed rpm : 500 Del.quantity cm3/: 68.0...70.0

1000 s: (66.0...72.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 11.50

rpm : 1270...1290 Speed

STARTING FUEL DELIVERY

: 100 Speed rpm

Del.quantity cm3/: 150.0...190.0

1000 s: (147.0...193.0)

Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 350

Rack travel in mm : 5.30...5.50 Del.quantity cm3/ : 16.0...20.0

1000 s: (13.5...22.5)

Spread cm3 : 3.50

1000 s: (5.50)

Remarks:

In unlatched condition, do not

operate greater than n = 500 1/min

Set shutoff stop 1.5...2.0 mm before

shutoff.

Note remarks

Edition : 21.08.92 Replaces : 02.91 Test oil : ISO-4113

Combination no. : 0 403 446 271

Injection pump

Pump designation : PES6Mw100/720RS1144

EP type number : 0 413 496 138

Governor

Governor design. : RQV300...1300MW50-11

: 0 420 083 235 Governer no.

Customer-spec. information Customer : M3-NF7

Engine : OM366A

1st version kW : 129.0 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 419 992 198

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

Openina .

pressure, bar : 172 ... 175

Test Lines : 1 680 750 089

Outside diameter x Wall thickness

x Length mm : 8.00x2.50x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80

: (3.65...3.85)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4 Phasina : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm: 1300

Rack travel in mm : 11.40...11.50

Del.quantity cm3/ : 7.8...8.0

100 s: (7.6...8.2)

Spread cm3 : 0.3

100 s: (0.6)

rpm : 300.02nd speed Rack travel in mm: 8.4...8.6 Del.quantity cm3/: 0.9...1.3

100 s: (0.6...1.5)

Spread cm3 : 0.3100 s: (0.5)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1450

travel mm 9.10...9.50

2nd speed : 1345 rpm

: 8.20...8.40 travel mm

3rd speed : 500 rpm

: 3.80...4.40 travel mm

4th speed : 300 rpm

travel mm : 1.10...1.50

5th speed rom

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1350 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300 Aneroid pressure h: 900

Del.quantity : 78.0...80.0

1000 : (76.0...82.0)

Spread : 3.50 cm3

1000 : (6.00)

RATED SPEED

H15

1st version Control lever position degrees: 110...118 Setting point: Speed rpm : 1350 Rack travel in mm: 16.5 Testina: 1st rack travel in: 10.40 Speed rpm : 1340...1350 2nd rack travel in: 4.00 rpm : 1440...1470 Speed 4th rack travel in: 1550 rom : 0.00...1.00Speed LOW IDLE 1 Control lever position degrees: 81...89 Setting point w/out bumper spring rpm : 300 Rack travel in mm: 8.5 Testing: Speed : 200 man. Minimum rack trave: 10.00 : 300 man Rack travel in mm : 8.40...8.60 CONSTANT REGULATION rpm : 330...500 Speed TORQUE CONTROL Dimension a mm : 0.80 Torque control curve - 1st version 1st speed rpm : 1300 Rack travel in m: 11.40...11.50 2nd speed rpm : 600 Rack travel in m: 12.20...12.30 3rd speed rpm : 900 Rack travel in m: 11.80...12.00 Aneroid/Altitude Compensator Test 1st version Settina Speed : 500 **CDM** Pressure hPa : -Rack travel mm : 10.50...10.60 Measurement 1/min: 500 Speed 1st pressure hPa : 225 Rack travel in m: 11.20...11.40

Rack travel in m: 12.20...12.30 START CUT-OUT 1/min: 230 (250) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 900 Speed rpm : 600 Del.quantity cm3/ : 67.0...70.0 1000 s: (64.5...72.5) cm3 : 5.00 Spread 1000 s: (7.00) Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/: 37.0...39.0 1000 s: (35.0...41.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 10.40 Speed rpm : 1340...1350 STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/: 78.0...88.0 1000 s: (75.0...91.0) LOW IDLE Speed rpm : 300 Rack travel in mm : 8.40...8.60 Del.quantity cm3/ : 9.0...13.0 1000 s: (6.5...15.5) cm3 : 3.50 1000 s: (5.50) Spread Remarks:

2nd pressure hPa : 325

3rd pressure hPa : 900

Rack travel in m: 11.90...12.10

#### BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Phasina : 0-60-120-180-240-300 Edition : 21.08.92 : 02.91 Replaces Tolerance + - ° : 0.50 (0.75) Test oil : ISO-4113 BASIC SETTING Combination no. : 0 403 446 274 1st speed rpm: 1300 Injection pump Pump designation : PES6MW100/720RS1131 Rack travel in mm: 10.90...11.00 EP type number : 0 413 406 123 Governor Del.quantity cm3/: 8.8...9.0 Governor design: : RQ300/1300MW105-10 : 0 420 082 062 Governer no. 100 s: (8.6...9.2) Customer-spec. information Spread cm3 : 0.3 Customer : MERCEDES-BENZ 100 s: (0.6) Engine : OM 366 A 2nd speed rpm : 300.01st version kW : 121.0 Rack travel in mm: 6.1...6.3 Rared speed : 2600 Dei.guantity cm3/: 1.0...1.4 100 s: (0.7...1.6) TEST BENCH REQUIREMENTS Spread cm3 : 0.3100 s: (0.5) Test oil inlet temp. °C : 38...42 **SUIDE SLEEVE POSITION** Control-lever position Overflow valve Degree: -2 : 1 419 992 198 rpm : 1200 Speed Rack travel in mm : 14.70...16.30 Inlet press., bar: 1.50 FULL LOAD DELIV. AT FULL LOAD STOP Test nozzle holder : 0 681 343 009 assembly 1st version Speed rpm : 1300 Opening. Aneroid pressure h: 700 pressure, bar : 172...175 Del.quantity : 88.0...90.0 1000 : (86.0...92.0) Spread cm3 : 3.50 Test lines : 1 680 715 089 1000 : (6.00) Outside diameter RATED SPEED x Wall thickness x Length mm : 8.00x2.50x600 1st version (A) Injection pump setting values Setting point: Insp. values in parentheses Speed : 1200 rpm Set equal delivery quant. Rack travel in mm: 15.5 per values Testing: BEGINNING OF DELIVERY 1st rack travel in: 9.90 Test pressure, bar: 30...32 rpm : 1345...1360 Speed

2nd rack travel in: 4.00

4th rack travel in: 1500

Speed

Speed

rpm : 1410...1440

rpm : 0.00...1.00

Prestroke mm

Firing order

: 3.70...3.80

Rack travel in mm : 9.00...12.00

: (3.65...3.75)

: 1-5-3-6-2-4

LOW IDLE 1

Setting point w/out bumper spring

Speed : 300 COM Rack travel in mm: 6.2

Testina:

Speed rom : 200 Minimum rack trave: 8.00 rpm : 300 Speed

Rack travel in mm : 6.10...6.30

Rack travel in mm : 2.00 Speed rpm : 510...550

TORQUE CONTROL

Dimension a mm : 0.70

Torque control curve - 1st version

1st speed rpm : 1300

Rack travel in m: 10,90...11.00

: 750 2nd speed rom

Rack travel in m: 11.60...11.70

3rd speed rpm : 1100

Rack travel in m: 11.10...11.30

Aneroid/Altitude Compensator Test

1st version

Settina

Speed : 500 COM Pressure hPa : -

Rack travel mm : 9.80...9.90

Measurement

1/min : 500 Speed

1st pressure hPa : 200

Rack travel in m: 10.20...10.30

2nd pressure hPa : 400

Rack travel in m: 11.10...11.40 3rd pressure hPa : 700

Rack travel in m: 11.60...11.70

START CUT-OUT

Speed 1/min : 200 (230)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700

Speed rpm : 750 Del.quantity cm3/ : 86.0...89.0

1000 s: (83.5...91.5)

Spread cm3 : 5.00

1000 s: (7.00)

Aneroid pressure h: -: 500 Speed rpm

Del.quantity cm3/: 49.0...51.0 1000 s: (47.0...53.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.90

Speed rpm : 1345...1360

STARTING FUEL DELIVERY

LOW IDLE

Speed rpm : 300

Rack travel in mm : 6.10...6.30 Del.quantity cm3/: 10.0...14.0 1000 s: (7.5...16.5)

cm3 : 3.50Spread

1000 s: (5.50)

:

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Edition : 21.08.92 Replaces : 02.91 Test oil : ISO-4113 Combination no. : 0 403 446 278 Injection pump Pump designation : PES6MW100/720RS1131 : 0 413 406 123 EP type number Governor Governor design. : RQV300...1300Mw50-17 : 0 420 083 244 Governer no. Customer-spec. information Customer : MERCEDES-BENZ : 0M 366 LA Engine 1st version kW : 150.0 : 2600 Rated speed TEST BENCH REQUIREMENTS Test oil inlet temp. "C : 38...42 Overflow valve : 1 419 992 198 Inlet press., bar: 1.50 Test nozzle holder : 0 681 343 009 assembly Opening pressure, bar : 172...175 Test lines : 1 680 750 089 Outside diameter x Wall thickness x Length mm : 8.00x2.50x600 (A) Injection pump setting values

```
Insp. values in parentheses
    Set equal delivery quant.
    per values
BEGINNING OF DELIVERY
Test pressure, bar: 30...32
Prestroke mm
                  : 3.70...3.80
                  : (3.65...3.85)
Rack travel in mm : 9.00...12.00
                  : 1-5- 3- 6- 2- 4
Firing order
H19
```

```
Phasing
                  : 0-60-120-180-240-300
Tolerance + - *
                 : 0.50 (0.75)
BASIC SETTING
1st speed
              rpm: 1300
Rack travel in mm : 12.20...12.30
Del.quantity cm3/: 9.6...9.8
             100 s: (9.4...10.0)
             cm3 : 0.3
Spread
             100 s: (0.6)
2nd speed
             rom : 300.0
Rack travel in mm : 6.1...6.3
Del.quantity cm3/ : 0.9...1.3
             100 s: (0.7...1.5)
Spread
             cm3 : 0.3
             100 s: (0.5)
(B) Setting of injection pump
   with governor
GUIDE SLEEVE TRAVEL
            rpm : 1500
1st speed
                  : 9.80...10.20
  travel mm
2nd speed
            rpm : 1350
                  : 8.40...8.60
  travel mm
3rd speed
             rpm : 670
  travel mm
                  : 4.60...5.20
                 : 300
4th speed
             rpm
                  : 1.10...1.50
 travel mm
GUIDE SLEEVE POSITION
Control-lever position
            Degree: -1
Speed
             rpm : 1370
Rack travel in mm : 15.20...17.80
FULL LOAD DELIV. AT FULL LOAD STOP
1st version
Speed
            rpm : 1300
Aneroid pressure h: 700
                 : 96.5...98.5
Del.quantity
            1000 : (94.5...100.5)
                 : 3.50
Spread
            cm3
            1000
                 : (6.00)
```

RATED SPEED

1st version

Control lever position degrees: 107...115 Setting point: Speed : 1370 COM Rack travel in mm: 16.5 Testina: 1st rack travel in: 11.20 rom : 1340...1350 Speed 2nd rack travel in: 4.00 Speed rpm : 1460...1490 4th rack travel in: 1550 Speed rpm : 0.00...1.00LOW IDLE 1 Control lever position degrees: 55...63 Setting point w/out bumper spring Speed rpm : 300 Rack travel in mm : 6.2

Testina: Speed : 100 rpm Minimum rack trave: 7.60 rom : 300 Rack travel in mm : 6.10...6.30

Rack travel in mm: 2.00

CONSTANT REGULATION rpm : 350...550 Speed

Aneroid/Altitude Compensator Test

1st version Setting Speed : 500 mQn Pressure hPa :

Rack travel mm : 10.20...10.30

1st pressure hPa : 170

Rack travel in m: 10.90...11.00

 $1/\min : 500$ 

2nd pressure hPa : 225
Rack travel in m: 11.90...12.20
3rd pressure hPa : 700

Rack travel in m: 12.20...12.30

START CUT-OUT

Measurement Speed

Speed 1/min : 220 (250)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700 : 575 rpm

Del.quantity cm3/: 82.0...85.0 1000 s: (79.5...87.5)

Spread cm3 : 5.001000 s: (7.00)

Aneroid pressure h: rpm : 500 Speed

Del.quantity cm3/: 50.5...52.5 1000 s: (48.5...54.5)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 11.20 rpm : 1340...1350 Speed

STARTING FUEL DELIVERY

: 100 Speed rpm

Del.quantity cm3/: 90.0...100.0

1000 s: (87.0...103.0)

LOW IDLE

Speed rpm : 300

Rack travel in mm : 6.10...6.30 Del.quantity cm3/: 9.0...13.0

1000 s: (7.0...15.0)

Spread cm3 : 3.501000 s: (5.50)

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS	
Note remarks	
Test sheet : MWM 6,2 F Edition : 21.08.92 Replaces : C4.92 Test oil : ISO-4113	
Combination no. : 0 403 446 292	
Injection pumo Pump designation : PES6MW100/720RS1131-	
EP type number : 0 413 406 165 Governor	
Governor design. : RQV3001300MW123 Governor no. : 0 420 083 255	
Customer—spec. information Customer : MERCEDES—BENZ	
Engine : OM366LA	
1st version kW : 170.0 Rated speed : 2600	
TEST BENCH REQUIREMENTS	
Test oil inlet temp. °C : 3842	
Overflow valve : 1 419 992 198	
Inlet press., bar : 1.50	
Test nozzle holder assembly : 0 681 343 009	
Opening pressure, bar : 172175	
Test Lines : 1 680 750 089	
Outside diameter x Wall thickness x Length mm : 8.00x2.50x600	
(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values	

```
Rack travel in mm : 9.00...12.00
Firing order : 1-5-3-6-2-4
Phasing
                 : 0-60-120-180-240-300
Tolerance + - °
                 : 0.50 (0.75)
BASIC SETTING
1st speed
             rpm : 1300
Rack travel in mm : 14.40...14.50
Del.quantity cm3/: 11.4...11.6
            100 s: (11.2...11.8)
Spread
            cm3 : 0.3
            100 s: (0.6)
            rpm : 300.0
2nd speed
Rack travel in mm: 6.3...6.5
Del.quantity cm3/: 1.0...1.4
            100 s: (0.7...1.6)
            cm3 : 0.3
Spread
            100 s: (0.5)
(B) Setting of injection pump
   with governor
GUIDE SLEEVE TRAVEL
            rpm : 1450
1st speed
 travel mm
                 : 9.40...9.80
            rpm : 1350
2nd speed
 travel mm
                 : 8.40...8.60
3rd speed
            rpm
                 : 600
                 : 3.70...4.30
 travel mm
4th speed
                 : 300
            rpm
                 : 0.80...1.20
 travel mm
GUIDE SLEEVE POSITION
Control-lever position
           Degree: -1
Speed
            rpm : 1350
Rack travel in mm : 15.20...17.80
FULL LOAD DELIV. AT FULL LOAD STOP
1st version
Speed
            rpm : 1300
Aneroid pressure h: 1000
                : 114.0...116.0
Del.quantity
           1000 : (112.0...118.0)
                 : 3.50
Spread
           cm3
           1000 : (6.00)
```

RATED SPEED

H21

BEGINNING OF DELIVERY

Prestroke mm

Test pressure, bar: 30...32

: 3.60...3.70 : (3.55...3.75)

1st version Control lever position degrees: 110...118 Setting point: Speed : 1350 rom Rack travel in mm: 16.5 Testina: 1st rack travel in: 13.40 rpm : 1340...1350 Speed 2nd rack travel in: 4.00 rpm : 1480...1510 Speed 4th rack travel in: 1600 Speed rom : 0.00...1.00LOW IDLE 1 Control Lever position degrees: 72...80 Setting point w/out bumper spring Speed COM Rack travel in mm: 6.4 Testing: Speed : 200 man Minimum rack trave: 8.00 rpm : 300 Speed Rack travel in mm: 6.30...6.50 Rack travel in mm: 2.00 rom : 440...500 Speed Aneroid/Altitude Compensator Test 1st version Setting Speed : 500 rom hPa : -Pressure : 10.70...10.80 Rack travel mm Measurement Speed 1/min: 500 1st pressure hPa : 200 Rack travel in m: 11.50...11.70 2nd pressure hPa : 400 Rack travel in m: 13.30...13.50 3rd pressure hPa : 1000 Rack travel in m: 14.40...14.50 START CUT-OUT

1/min: 180 (200)

FUEL DELIVERY CHARACTERISTICS

Aneroid pressure h: 1000 : 750 Speed rpm Del.quantity cm3/: 106.5...109.5 1000 s: (104.0...112.6) cm3 : 5.00 Spread 1000 s: (7.00) Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/ : 41.0...43.0 1000 s: (39.0...45.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 13.40 rpm : 1340...1350 Speed STARTING FUEL DELIVERY : 100 Speed rpm Del.quantity cm3/: 100.0...110.0 1000 s: (97.0...113.0) LOW IDLE rpm : 300 Speed Rack travel in mm : 6.30...6.50 Del.quantity cm3/: 10.0...14.0 1000 s: (7.5...16.5) Spread cm3 : 3.501000 s: (5.50) Remarks:

H22

1st version

Speed

Note remarks

Test sheet : MM 6,2 F Edition : 21.08.92 Replaces : 04.92 Test oil : ISO-4113

Combination no. : 0 403 446 294

Injection pump

Pump designation : PES6FW100/720RS1131-

En type number : 0 413 406 165

Governor

Governor design. : RQV350...1100MW67-4

Governer no. : 0 420 083 261

Customer-spec, information

: MERCEDES-BENZ Customer

Engine : OM365LA

1st version kW : 162.0 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 419 992 198

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 909 assembly

Opening

pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter

x Wall thickness

: 8.00x2.50x600 x Length mm

(A) Injection pump setting values insp. values in parentheses Set equal delivery quant.

per values

SEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 3.60...3.70 Prestroke mm

: (3.55...3.75)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

: 0-60-120-180-240-300 Phasina

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

rpm: 1100 1st speed

Rack travel in mm : 13.60...13.70

Del.quantity cm3/: 11.2...11.4

100 s: (11.0...11.6)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 350.0 Rack travel in mm : 5.3...5.5 Del.quantity cm3/: 0.9...1.3

100 s: (0.6...1.5)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 1150 1st speed

travel mm : 7.70...8.10

2nd speed rpm : 900

travel mm 5.80...6.00 : 500

3rd speed **mci.u** travel mm

: 2.50...3.10 rpm : 350 4th speed

travel mm : 1.20...1.60

GUIDE SLEEVE POSITION Control-lever position

Degree: -1 Speed rpm : 1150

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1100 Speed Aneroid pressure h: 1000

Del quantity : 112.0...114.0

1000 : (110.0...116.0)

: 3.50 Spread cm3 1000 : (6.00)

RATED SPEED

1st version Control Lever position degrees: 120...128 Setting point: Speed : 1150 mon Rack travel in mm: 16.5 Testing: 1st rack travel in: 12.60 rpm : 1140...1150 Speed 2nd rack travel in: 4.00 rom : 1285...1315 Speed 4th rack travel in: 1450 nom : 0.00...1.00Speed LOW IDLE 1 Control Lever position degrees: 74...82 Setting point w/out bumper spring rpm : 350 Rack travel in mm: 5.4 Testina: Speed : 200 rom Minimum rack trave: 7.00 rpm : 350 Speed Pack travel in mm : 5.30...5.50 Aneroid/Altitude Compensator Test 1st version Settina : 500 Speed rpm hPa : -Pressure : 9.40...9.50 Rack travel mm Measurement 1/min: 500 Speed 1st pressure hPa : 400 Rack travel in m: 10.60...10.80 2nd pressure hPa : 600 Rack travel in m: 12.60...12.80 3rd pressure hPa : 1000 Rack travel in m: 13.60...13.80 START CUT-OUT 1/min: 250 (270) Speed FUEL DELIVERY CHARACTERISTICS

Del.quantity cm3/: 104.5...107.5 1000 s: (102.0...110.0) cm3 : 5.00 1000 s: (7.00) Spread Aneroid pressure h: -Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/: 35.0...37.0 1000 s: (33.0...39.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 12.60 rpm : 1140...1150 Speed STARTING FUEL DELIVERY : 100 Speed rc:n Del.quantity cm3/: 100.0...110.0 1000 s: (97.0...113.0)

LOW IDLE

Remarks:

H24

Speed

1st version

Aneroid pressure h: 1000

rpm : 600

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : MWM 6,2 F Edition : 21.08.92 Replaces : MM 6,2 Test oil : ISO-4113 Combination no. : 0 403 446 295 Injection pump Pump designation : PES6MW100/720RS1131-EP type number : 0 413 406 165 Governor Governor design. : RQV300...1300MW67-5 Governer no. : 0 420 083 262 Customer-spec, information Customer : MERCEDES-BENZ Engine : CM 366 LA 1st version kw : 155.0 : 2600 Rated speed TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 419 992 198 Inlet press., bar: 1.50 Test nozzle holder : C 681 343 009 assembly Opening pressure, bar : 172...175 : 1 680 750 089 Test lines Outside diameter x Wall thickness x Length mm : 8.00x2.50x600 (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values \_ BEGINNING OF DELIVERY Test pressure, bar: 30...32

> : 3.60...3.70 : (3.55...3.75)

Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4 Phasing : 0-60-120-180-240-300 Tolerance + - \* : 0.50 (0.75) BASIC SETTING 1st speed rpm: 1300 Rack travel in mm : 13.10...13.20 Del.quantity cm3/: 9.8...10.0 100 s: (9.6...10.2) Spread cm3 : 0.3100 s: (0.6) rpm : 300.02nd speed Rack travel in mm: 6.1...6.3 Del.quantity cm3/: 0.9...1.3 100 s: (0.6...1.5) Spread cm3 : 0.3100 s: (0.5) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL rpm : 1350 1st speed travel mm : 8.40...8.80 2nd speed rpm : 880 : 4.90...5.10 travel mm 3rd speed rpm : 500 travel mm : 2.70...3.30 4th speed rpm : 300 travel mm : 1.20...1.60 GUIDE SLEEVE POSITION Control-lever position Degree: -1 rpm : 1350 Speed Rack travel in mm : 15.20...17.80 FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 1300 Aneroid pressure h: 1000 Del.quantity : 98.0...100.0 1000 : (96.0...102.0) cm3 : 3.50 Spread 1000 : (6.00)

RATED SPEED

Prestroke mm

1st version Control Lever position degrees: 116...124 Setting point: Speed חסרו : 1350 Rack travel in mm : 16.5 Testing: 1st rack travel in: 12.10 rpm : 1340...1350 Speed 2nd rack travel in: 4.00 rpm : 1450...1480 Speed 4th rack travel in: 1550 nom : 0.00...1.00Speed LOW IDLE 1 Control Lever position degrees: 72...80 Setting point w/out bumper spring : 300 rpm Rack travel in mm: 6.2 Testing: Speed : 200 rpm Minimum rack trave: 7.50 rpm : 300 Rack travel in mm: 6.10...6.30 SET IDLE AUXILIARY SPRING Rack travel in mm: 2.00 Aneroid/Altitude Compensator Test 1st version Setting Speed : 500 rom Pressure hPa : -Rack travel mm : 10.20...10.30 Measurement Speed  $1/\min : 500$ 1st pressure hPa : 200 Rack travel in m: 11.20...11.30 2nd pressure hPa : 350 Rack travel in m: 12.10...12.40 3rd pressure hPa : 1000 Rack travel in m: 13.10...13.20

1st version Aneroid pressure h: 1000 Speed rpm : 600 Del.quantity cm3/ : 85.0...88.0 1000 s: (82.5...90.5) Spread cm3 : 5.00 1000 s: (7.00) Aneroid pressure h: -Aneroid pressure h: rpm : 500 Speed Del.quantity cm3/: 35.0...37.0 1000 s: (33.0...39.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 12.10 rpm : 1340...1350 Speed STARTING FUEL DELIVERY Speed : 100 rpm Del.quantity cm3/: 100.0...110.0 1000 s: (97.0...113.0) LOW IDLF rpm : 300 Speed Rack travel in mm : 6.10...6.30 Del.quantity cm3/: 9.0...13.0 1000 s: (6.5...15.5) cm3 : 3.50 Spread 1000 s: (5.00) Remarks:

Speed

START CUT-OUT

1/min : 220 (250)

FUEL DELIVERY CHARACTERISTICS

#### Note remarks

Test sheet : MWM 6,2 F Edition : 21.08.92 : 04.92 Replaces : ISO-4113 Test oil

Combination no. : 0 403 446 306

Injection pump

Pump designation : PES6MW100/720RS1131

: 0 413 406 123 EP type number

Governor

Governor design. : RQV300...1300MW67-6

: 0 420 083 274 Governer no.

Customer-spec. information

Customer : MERCEDES-BENZ

: OM 366 A Engine

: 121.0 1st version kW Rated speed : 2600

#### TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 419 992 198

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

**Opening** 

: 172...175 pressure, bar

Test Lines : 1 680 715 089

Outside diameter x Wall thickness

: 8.00x2.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 3.70...3.80 Prestroke mm

: (3.65...3.85) Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

Phasina : 0-60-120-180-240-300

Tolerance + - " : 0.50 (0.75)

#### BASIC SETTING

rom : 13001st speed

Rack travel in mm: 10.50...10.60

Del.quantity cm3/: 8.8...9.0

100 s: (8.6...9.2)

cm3 : 0.3Spread

100 s: (0.6)

rpm : 300.0 2nd speed Rack travel in mm: 5.6...5.8 Del.quantity cm3/: 1.0...1.4

100 s: (0.7...1.6)

Spread cm3 : 0.3100 s: (0.5)

## (B) Setting of injection pump with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1450 : 9.50...9.90 travel mm

rpm : 1350 2nd speed : 8.60...8.80 travel mm

rpm : 500 3rd speed : 2.70...3.30 travel mm

: 300 4th speed rpm

: 1.20...1.60 travel mm

### GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1350

Rack travel in mm : 15.20...17.80

### FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300 Aneroid pressure h: 700

: 88.0...90.0 Del.quantity

1000 : (86.0...92.0) : 3.50 cm3

Spread 1000 : (6.00)

RATED SPEED

1st version Control lever position degrees: 116...124 Setting point: Speed : 1350 rpm Rack travel in mm : 16.5 Testing: 1st rack travel in: 9.50 rpm : 1340...1350 Speed 2nd rack travel in: 4.00 rpm : 1415...1445 Speed 4th rack travel in: 1550 rpm : 0.0ე...1.00 Speed LOW IDLE 1 Control lever position degrees: 72...80 Setting point w/out bumper spring Speed rom : 300 Rack travel in mm: 5.7 Testing: Speed CDU! : 200 Minimum rack trave: 7.50 Speed rpm : 300 Rack travel in mn : 5.60...5.80 TORQUE CONTROL Dimension a mm : 0.80 Torque control curve - 1st version 1st speed mom : 1300 Rack travel in m: 10.50...10.60 rpm : 850 2nd speed Rack travel in m: 11.20...11.40 d speed rpm : 1100 3rd speed Rack travel in m: 10.70...10.90 Aneroid/Altitude Compensator Test 1st version Setting Speed : 500 rpm Pressure hPa : : 9.20...9.30 Rack travel mm Measurement Speed  $1/\min : 500$ 1st pressure hPa : 300 Rack travel in m: 9.70...9.90 2nd pressure hPa : 400 Rack travel in m: 10.50...10.70 3rd pressure hPa : 700 Rack travel in m: 11.20...11.40 START CUT-OUT

1/min: 220 (240) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 700 : 850 Speed mqn Del.quantity cm3/: 88.0...91.0 1000 s: (85.5...93.5) cm3 : 5.00 Spread 1000 s: (7.00) Aneroid pressure h: -Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/: 49.0...51.0 1000 s: (47.0...53.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 9.50 Speed rpm : 1340...1350 STARTING FUEL DELIVERY Speed : 100 rpm Del.quantity cm3/: 80.0...90.0 1000 s: (77.0...93.0) LOW IDLE Speed rpm : 300 Rack travel in mm : 5.60...5.80 Del.quantity cm3/: 10.0...14.0 1000 s: (7.5...16.5) cm3 : 3.50 Spread 1000 s: (5.50) Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS Test pressure, bar: 30...32 Note remarks Prestroke mm : 3.00...3.10 : (2.95...3.15) Rack travel in mm : 13.50...0.00 Test sheet : MWM 6,2 F Edition : 21.09.92 Firing order : 1-5-3-6-2-4 Replaces : MWM 6,2 Test oil : ISO-4113 Combination no. : 0 403 446 309 Phasing : 0-60-120-180-240-300 Phasing Injection pump Tolerance + - ° : 0.50 (0.75) Pump designation : PES6MW100/320RS1227 EP type number : 0 413 406 215 BASIC SETTING Governor Governor design. : RQV325...1300Mw126 1st speed rpm: 1000 Governer no. : 0 420 083 279 Rack travel in mm : 13.10...13.20 Cust. part no. : 1249951 Del.quantity cm3/: 10.8...11.0 Customer-spec. information Customer : DAF 100 s: (10.6...11.2) Engine : NS156L Spread cm3 : 0.31st version kW : 156.0 100 s: (0.6) Rated speed : 2600 rpm : 325.0 2nd speed TEST BENCH REQUIREMENTS Rack travel in mm: 4.4...4.6 Del.quantity cm3/: 0.7...1.1 Test oil 100 s: (0.4...1.3) inlet temp. °C : 38...42 Spread cm3 : 0.3100 s: (0.5) Overflow valve : 1 419 992 198 (B) Setting of injection pump with governor Inlet press., bar: 1.50 GUIDE SLEEVE TRAVEL Test nozzle holder rpm : 1350 1st speed : 1 688 901 101 assembly travel mm : 8.40...8.80 : 875 2nd speed LDW. Openina | : 4.90...5.10 travel mm pressure, bar : 207...210 : 500 3rd speed rom travel mm : 2.70...3.30 Orifice plate : 325 4th speed rpm diameter mm : 0.6 travel mm : 1.50...1.90 FULL LOAD DELIV. AT FULL LOAD STOP Test lines : 1 680 750 008 1st version Outside diameter Speed rpm : 1000 x Wall thickness Aneroid pressure h: 1000 : 108.5...110.5 x Length mm : 6.00x2.00x600 Del.quantity 1000 : (106.5...112.5) (A) Injection pump setting values Spread cm3 : 3.50 Insp. values in parentheses 1000 : (6.00) Set equal delivery quant. per values RATED SPEED

1st version

J01

BEGINNING OF DELIVERY

Control lever position degrees: 119...127 Testing: 1st rack travel in: 12.10 rpm : 1330...1340 Speed 2nd rack travel in: 4.00 rpm : 1455...1485 Speed 4th rack travel in: 1550 Speed rpm : 0.00...1.00LOW IDLE 1 Control lever position degrees: 78...86 Setting point w/out bumper spring rpm : 325 Rack travel in mm: 4.5 Testing: : 150 Speed r;om Minimum rack trave: 7.00 rpm : 325 Rack travel in mm : 4.40...4.60 Aneroid/Altitude Compensator Test 1st version Setting : 600 Speed rom Pressure hPa : 1000 Rack travel mm : 13.10...13.20 Measurement Speed 1/min : 690 1st pressure hPa : 500 Rack travel in m: 12.50...12.60 2nd pressure hPa : 290 Rack travel in m: 11.10...11.40 3rd pressure hPa :-Rack travel in m: 10.30...10.50 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1000 Speed rpm : 1300 Del.quantity cm3/ : 103.0...106.0 1000 s: (100.5...108.5) Spread cm3 : 5.00 1000 s: (7.00) Aneroid pressure h: -

rpm : 600 Del.quantity cm3/: 63.0...65.0

1000 s: (61.0...67.0)

## **BREAKAWAY**

1st version 1mm rack travel less than

full load rack tr: 12.10

rpm : 1330...1340 Speed

LOW IDLE

Speed rpm : 325

Rack travel in mm : 4.40...4.60 Del.quantity cm3/ : 7.0...11.0

1000 s: (4.5...13.5)

:

cm3 : 3.50Spread 1000 s: (5.50)

Remarks:

102

Speed

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : MMM 6,2 F Edition : 21.09.92 Replaces : 04.92 Test oil : ISO-4113 Combination no. : 0 403 456 120 Injection pump Pump designation : PES6MW100/321RS1210 EP type number : 0 413 406 201 Governor Governor design. : RQ250/1050MW84-11 Governer no. : 0 420 082 066 Cust. part no. : 3-7220

Customer-spec, information Customer : MAN Engine : D 0826 LUH 06

1st version kW : 184.0 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 419 992 198

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

Opening

pressure, bar : 172...175

Test lines : 1 680 750 003

Outside diameter x Wall thickness

: 6.00x2.00x600 x Lenath mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values \_\_\_\_

BEGINNING OF DELIVERY Test pressure, bar: 30...32 Prestroke mm : 3.50...3.60 : (3.45...3.65) Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4

Phasina : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 800

Rack travel in mm : 14.00...14.10

Del.quantity cm3/: 16.1...16.3

100 s: (15.8...16.6)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 250.0 Rack travel in mm: 5.0...5.2 Del.quantity cm3/: 1.3...1.7 100 s: (1.0...1.9)

cm3 : 0.3

Spread 100 s: (0.5)

GUIDE SLEEVE POSITION Control-Lever position Degree: -2

rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

Speed rpm : 800 Aneroid pressure h: 1100

Del.quantity : 161.0...163.0 1000 : (158.0...166.0)

Spread cm3 : 4.00

1000 : (7.50)

RATED SPEED

1st version

Setting point:

Speed : 600 rom Rack travel in mm : 20.0

Testing:

1st rack travel in: 13.00

rpm : 1075...1090 Speed 2nd rack travel in: 4.00 rom : 1130...1160 Speed 4th rack travel in: 1250 Speed rom : 0.00...1.00LOW IDLE 1 Control Lever position degrees: 76...84 Setting point w/out bumper spring rpm : 250 Rack travel in mm: 5.1 Testina: rpm : 100Speed Minimum rack trave: 6.50 Speed rpm : 250 Rack travel in mm : 5.00...5.20 TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 800 Rack travel in m: 14.00...14.10 rpm : 600 2nd speed Rack travel in m: 14.00...14.10 3rd speed rpm : 1050 Rack travel in m: 14.00...14.10 Aneroid/Altitude Compensator Test 1st version Setting : 500 Speed rom Pressure hPa : -Rack travel mm : 9.40...9.50 Measurement 1/min: 500 Speed 1st pressure hPa : 150 Rack travel in m: 9.70...9.80 2nd pressure hPa : 700 Rack travel in m: 13.20...13.50 3rd pressure hPa : 1100 Rack travel in m: 14.00...14.10 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1100 rpm : 600 Del.quantity cm3/: 161.0...165.0 1000 s: (158.0...168.0) Spread cm3 : 6.001000 s: (9.00) Aneroid pressure h: 1100 Speed rpm : 1050

LOW IDLE

Remarks:

J04

BOSCH INJ. PUMP TEST SPECIFICATIONS Prestroke mm : 3.60...3.70 : (3.55...3.75) Note remarks Rack travel in mm : 15.00...0.00 Firing order : 1-5-3-6-2-4 Test sheet : MWM 6,2 F Edition : 21.09.92 : 04.92 Replaces Test oil : ISO-4113 Phasing : 0-60-120-180-240-300 Combination no. : 0 403 456 121 Tolerance + - ° : 0.50 (0.75)Injection pump Time to cyl. no. : 1 Pump designation: PES6MW100/321RS1186 EP type number : 0 413 406 168 BASIC SETTING Governor Governor design. : RQ250/1200MW84-12 1st speed rom: 800 : 0 420 082 067 Governer no. Rack travel in mm : 14.80...14.90 Cust. part no. : 3-7221 Del.quantity cm3/: 12.6...12.8 Customer-spec. information Customer : MAN 100 s: (12.4...13.0) Engine : D 0826 LUH03 Spread cm3 : 0.41st version kW : 157.0 100 s: (0.7) Rated speed : 2400 2nd speed rpm : 250.0 TEST BENCH REQUIREMENTS Rack travel in mm: 5.9...6.1 Del.quantity cm3/: 1.9...2.3 Test oil 100 s: (1.6...2.5) inlet temp. °C : 38...42 cm3 : 0.3Spread 100 s: (0.5) Overflow valve : 1 419 992 198 GUIDE SLEEVE POSITION Control-lever position Inlet press., bar: 1.50 Degree: -2 Speed rpm : 600 Test nozzle holder Rack travel in mm : 14.70...16.30 assembly : 0 681 343 009 FULL LOAD DELIV. AT FULL LOAD STOP Openina pressure, bar : 172...175 1st version Speed rpm : 800 Aneroid pressure h: 1000 Test lines : 1 680 750 008 : 126.0...128.0 Del.quantity 1000 : (124.0...130.0) Outside diameter : 4.00 Spread cm3 x Wall thickness 1000 : (7.50) x Length mm : 6.00X2.00X600 RATED SPEED (A) Injection pump setting values Insp. values in parentheses 1st version Set equal delivery quant. per values Setting point: : 600

LDW

Rack travel in mm: 15.5

1st rack travel in: 13.30

Testing:

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 1245...1260 Speed man 2nd rack travel in: 4.00 rpm : 1290...1320 Speed 4th rack travel in: 1400 Speed rpm : 0.00...1.50LOW IDLE 1 Control Lever position degrees: 73...81 Setting point w/out bumper spring Speed rpm : 250 Rack travel in mm: 6.0 Testina: Speed : 100 CAT Minimum rack trave: 7.50 rpm : 250 Rack travel in mm : 5.90...6.10 TORQUE CONTROL Dimension a mm : 0.50 Torque control curve - 1st version : 800 1st speed rpm Rack travel in m: 14.80...14.90 2nd speed : 600 CDM Rack travel in m: 14.80...14.90 3rd speed : 1000 rom Rack travel in m: 14.50...14.70 4th speed rpm : 1200 Rack travel in m: 14.30...14.40 Aneroid/Altitude Compensator Test 1st version Setting : 500 Speed תכרו Pressure hPa : Rack travel mm : 12.30...12.40 Measurement 1/min: 500 Speed 1st pressure hPa : 200 Rack travel in m: 12.70...12.80 2nd pressure hPa : 400 Rack travel in m: 13.80...14.10 3rd pressure hPa : 1000 Rack travel in m: 14.80...14.90 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1000 Speed rpm : 600 Del.quantity cm3/: 126.0...130.0 1000 s: (123.0...133.0)

cm3 : 6.00Spread 1000 s: (9.00) Aneroid pressure h: 1000 Speed rpm : 1000 Del.quantity cm3/ : 126.0...130.0 1000 s: (123.0...133.0) Speed rpm : 1200 Del.quantity cm3/ : 122.0...126.0 1000 s: (119.0...129.0) Aneroid pressure h: rpm : 500 Speed Del.quantity cm3/: 74.0...76.0 1000 s: (72.0...78.0) **BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 13.30 Speed rpm : 1245...1260

STARTING FUEL DELIVERY

: 100 Speed ripm Del.quantity cm3/: 60.0...80.0 1000 s: (57.0...83.0)

LOW IDLE

Speed rom : 250 Rack travel in mm : 5.90...6.10 Del.quantity cm3/: 19.0...23.0 1000 s: (16.5...25.5) Spread cm3 : 3.501000 s: (5.50)

Remarks:

Note remarks

Test sheet : CUM 8,3 a 5 Edition : 21.09.92 Replaces : 07.87

Test oil : ISO-4113

Combination no. : 9 400 083 454

Injection pump

Pump designation : PES6A100D320/3RS2691

EP type number : 9 410 230 025

Governor

Governor design. : RSV400...900A7c2209-

18

Governer no. : 9 420 083 232

Customer-spec. information Customer : CUMMINS

Engine : 6 CT 8.3

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 419 992 198

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

Openina

pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 2.80...2.90 Prestroke mm : (2.75...2.95)

Rack travel in mm : 9.00...12.00

Firing order : 1-5- 3- 6- 2Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00

& maximum rack tra: 21.00

Difference ° CS : 3.00...4.00

BASIC SETTING

1st speed rom: 900

Rack travel in mm : 12.70...12.80

Del.quantity cm3/: 12.9...13.0

100 s: (12.7...13.2)

Spread cm3 : 0.3

100 s: (0.6)

rpm : 400.02nd speed

Rack travel in mm: 5.9...6.1 Del.quantity cm3/: 1.6...2.0

100 s: (1.4...2.3)

cm3 : 0.3Spread

100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

Speed rpm : 800 Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 5.25

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900

: 129.0...130.0 Del.quantity

1000 : (127.0...132.0) Spread

: 3.50 cm3

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 104...112

Testing:

1st rack travel in: 11.70 rpm : 943...948 Speed 2nd rack travel in: 4.00 rpm : 977...986 Speed 4th rack travel in: 1100 rom : 0.30...1.70Speed

LOW IDLE 1 Control Lever

position degrees: 74...82 Setting point w/out bumper spring rpm : 400

Rack travel in mm: 5.5

Testina:

Speed rpm : 100 Minimum rack trave: 19.00 Speed rpm : 400 Rack travel in mm : 5.90...6.10 Rack travel in mm : 2.00

Speed rpm : 415...475

TORQUE CONTROL

Torque control curve - 1st version

rpm : 900 1st speed

Rack travel in m: 12.70...12.80

2nd speed rpm : 550

Rack travel in m: 12.70...12.90

5th speed rpm : 400

Rack travel in m: 14.00...14.60

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 11.70 Speed rom : 943...948

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 135.0...149.0 1000 s: (132.0...152.0)

Rack travel in mm : 19.00...21.00

LOW IDLE

: 400 Speed MCC Rack travel in mm : 5.90...6.10 Del.quantity cm3/: 16.5...20.5

1000 s: (14.0...23.0)

Spread cm3 : 3.50

1000 s: (5.50)

Remarks:

Start-of-delivery mark at 10° cam rotation angle after start of delivery, cylinder 1

**APPLICATION** 

Generator

108

Note remarks

Test sheet

: 21.09.92 Edition

Replaces

Test oil : ISO-4113

Combination no. : 9 400 083 454DF

Injection pump

Pump designation : PES6A100D320/3RS2691

EP type number : 9 410 230 025

Governor

: RSV400...900A7C2209-Governor design.

1R

: 9 420 083 232 Governer no.

Customer-spec. information Customer : CUMMINS

: 6 CT 8.3 Engine

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 419 992 198

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

Openina .

pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter x Wall thickness

x Lenath mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 2.80...2.90 : (2.75...2.95) Prestroke mm

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00 & maximum rack tra: 21.00

Difference \* CS : 3.00...4.00

BASIC SETTING

1st speed rpm: 900

Rack travel in mm : 11.10...11.20

Del.guantity cm3/: 10.1...10.2

100 s: (9.9...10.4)

Spread cm3 : 0.3

100 s: (0.6)

rpm : 400.02nd speed

Rack travel in mm : 5.9...6.1 Del.quantity cm3/ : 1.6...2.0

100 s: (1.4...2.3)

cm3 : 0.3Spread 100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3 rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension Click setting x : 5.25

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

Speed rpm : 900

: 101.0...102.0 Del.quantity 1000 : (99.0...104.0)

: 3.50 Spread cm3

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 103...111

Testing:

1st rack travel in: 10.10 Speed rpm : 943...948 2nd rack travel in: 4.00 Speed rpm : 970...979 4th rack travel in: 1150 Speed rpm : 0.30...1.70

LOW IDLE 1 Control Lever

position degrees: 74...82 Setting point w/out bumper spring

Speed rpm : 400 Rack travel in mm: 5.5

Testina:

Speed : 100 rpm Minimum rack trave: 19.00 : 400 Speed MCT

Rack travel in mm : 5.90...6.10

Rack travel in mm: 2.00 Speed rom : 415...475

TORQUE CONTROL

Torque control curve - 1st version

rpm : 900 1st speed Rack travel in m: 11.10...11.20

2nd speed rpm : 550 Rack travel in m: 11.10...11.30

5th speed rpm : 400

Rack travel in m: 12.30...12.90

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 10.10 Speed : 943...948 rom

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/: 135.0...149.0

1000 s: (132.0...152.0)

Rack travel in mm : 19.00...21.00

LOW IDLE

Speed : 400 rpm

Rack travel in mm : 5.90...6.10 Del.quantity cm3/: 16.5...20.5 1000 s: (14.0...23.0) cm3 : 3.50 1000 s: (5.50)

Spread

Remarks:

Start-of-delivery mark at 10° cam rotation angle after start of delivery, cylinder 1

**APPLICATION** 

Generator

J10

Note remarks

Test sheet : CUM

: 21.09.92 Edition

Replaces

Test oil : ISO-4113

: 9 400 083 454DG Combination no.

Injection pump

Pump designation: PES6A100D320/3RS2691

EP type number ; 9 410 230 025

Governor

Governor design. : RSV400...900A7C2209-

: 9 420 083 232 Governer no.

Customer-spec. information Customer : CUMMINS

Engine : 6 CT 8.3

TEST BENCH REQUIREMENTS

Test oil

inlet temp. \*C : 38...42

Overflow valve

: 1 419 992 198

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Openina

pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90 : (2.75...2.95)

Rack travel in mm : 9.00...12.00

: 1-5-3-6-Firing order

Phasing : 0-60-120-180-240-300

Tolerance + - \* : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00

& maximum rack tra: 21.00

Difference \* CS : 3.00...4.00

BASIC SETTING

1st speed rpm: 900

Rack travel in mm: 12.70...12.80

Del.quantity cm3/: 12.9...13.0

100 s: (12.7...13.2)

cm3 : 0.3Spread

100 s: (0.6)

2nd speed rpm : 400.0 Rack travel in mm : 5.9...6.1

Del.quantity cm3/: 1.6...2.0

100 s: (1.4...2.3) cm3 : 0.3Spread

100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

rpm : 800 Speed

Rack travel in mm : 0.30...1.00

Governor spring pre-tension Click setting x : 5.25

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 900 Speed

: 129.0...130.0 Del.quantity 1000 : (127.0...132.0)

: 3.50 Spread cm3

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 104...112

Testing:

1st rack travel in: 11.70 rpm : 943...948 Speed 2nd rack travel in: 4.00 rpm : 977...986 Speed 4th rack travel in: 1100 Speed rom : 0.30...1.70

LOW IDLE 1 Control Lever

position degrees: 74...82 Setting point w/out bumper spring Speed rpm : 400 Rack travel in mm: 5.5

Testing:

Speed rpm : 100 Minimum rack trave: 19.00 : 400 Speed חמרו Rack travel in mm : 5.90...6.10

Rack travel in mm : 2.00

Speed : 415...475 man

TORQUE CONTROL

Torque control curve - 1st version

rpm : 900 1st speed

Rack travel in m: 12.70...12.80

rpm : 550 2nd speed

Rack travel in m: 12.70...12.90

5th speed rpm : 400

Rack travel in m: 14.00...14.60

BREAKAWAY

ist version 1mm rack travel less than

full load rack tr: 11.70 Speed rom : 943...948

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/: 135.0...149.0

1000 s: (132.0...152.0)

Rack travel in mm : 19.00...21.00

LOW IDLE

rpm : 400 Speed

Rack travel in mm : 5.90...6.10 Del.quantity cm3/: 16.5...20.5 1000 s: (14.0...23.0) Spread cm3 : 3.50 1000 s: (5.50)

Remarks:

rotation angle after start of delivery, cylinder 1

Start-of-delivery mark at 10° cam

**APPLICATION** 

Generator

J12

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : CUM 5,9 x Edition : 21.09.92 Replaces : 10.91 Test oil : ISO-4113 Combination no. : 9 400 083 459 Injection pump Pump designation : PES6A95D12ORS2822 EP type number : 9 400 084 029 Governor Governor design. : RQV350...1250AB1235-Governer no. : 9 420 080 311 Customer-spec. information Customer : CUMMINS Engine : 6 BT 1st version kW : 119.3 : 2500 Rated speed TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 419 992 198 Inlet press., bar: 1.50 Test nozzle holder assembly : 0 681 343 009 Opening : 172...175 pressure, bar Test lines : 1 680 750 014 Outside diameter x Wall thickness x Length mm : 6.00x2.00x600 (A) Injection pump setting values

Insp. values in parentheses

: 2.75...2.85 : (2.70...2.90)

Set equal delivery quant.

per values

Prestroke mm

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4 Phasing : 0-60-120-180-240-300 Tolerance + - ° : 0.50 (0.75) Time to cyl. no. : 1 BEGINNING OF DELIVERY DIFFERENCE betw. rack trav. m: 9.00...12.00 & maximum rack tra: 21.00 Difference \* CS : 2.00...3.00 BASIC SETTING 1st speed rpm : 1250 Rack travel in mm : 12.70...12.80 Del.quantity cm3/: 8.6...8.8 100 s: (8.4...9.0) cm3 : 0.3Spread 100 s: (0.6) 2nd speed rpm : 350.0 Rack travel in mm: 5.0...5.2 Del.quantity cm3/ : 0.6...1.0 100 s: (0.4...1.2) cm3 : 0.3Spread 100 s: (0.5) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL rpm : 1300 1st speed : 6.80...6.90 travel mm 2nd speed rpm : 350 : 1.20...1.70 travel mm 3rd speed rpm : 700 : 4.00...4.50 travel mm 4th speed rpm : 1550 travel mm : 8.30...8.80 GUIDE SLEEVE POSITION Control-lever position Degree: -1 rpm : 1530 Speed Rack travel in mm : 15.20...17.80 FULL LOAD DELIV. AT FULL LOAD STOP

1st version

nom : 1250 Speed Aneroid pressure h: 600 : 86.0...88.0 Del.quantity 1000 : (84.0...90.0) cm3: 3.50 Spread 1000 : (6.00) RATED SPEED 1st version Control Lever position degrees: 107...115 Testing: 1st rack travel in: 11.70 : 1310...1320 Speed rpm 2nd rack travel in: 4.00 Speed : 1545...1575 rom 4th rack travel in: 1750 Speed : 0.00...1.00 rpm LOW IDLE 1 Control lever position degrees: 63...71 Testina: Speed mc<sub>C</sub> : 100 Minimum rack trave: 7.00 mom Rack travel in mm : 5.00...5.20 CONSTANT REGULATION : 475...575 Speed rom Aneroid/Altitude Compensator Test 1st version Setting Speed : 500 **CDM** Pressure hPa : 600 Rack travel mm : 12.70...12.80 Measurement 1/min: 500 Speed 1st pressure hPa : -Rack travel in m: 11.60...11.90 2nd pressure hPa : 320 Rack travel in m: 11.70...11.80 \* 3rd pressure hPa : 410 Rack travel in m: 12.30...12.50 START CUT-OUT 1/min: 270 (290) Speed

1st version Aneroid pressure h: 600 : 700 **CDM** Del.quantity cm3/: 80.0...83.0 1000 s: (77.5...85.5) Aneroid pressure h: rpm : 500 Speed Del.quantity cm3/: 64.0...67.0 1000 s: (62.0...69.0) BREAKAWAY 1st version 1mm rack travel less than full lead rack tr: 11.70 rpm : 1310...1320 Speed STARTING FUEL DELIVERY Speed rpm : 1(10 Det.quantity cm3/: 115.0...135.0 1000 s: (110.0...140.0) Rack travel in mm : 19.00...21.00 LOW IDLE : 350 rpm Rack travel in mm : 5.00...5.20 Del.quantity cm3/: 6.0...10.0 1000 s: (4.0...12.0) cm3 : 3.50 1000 s: (5.50) Spread Remarks: Start-of-delivery mark at 10° cam rotation angle after start of delivery, cylinder 1 \* Increase in control-rod travel with respect to setting at least 0.1 mm

FUEL DELIVERY CHARACTERISTICS

Note remarks

Test sheet

Edition Replaces

: CUM : 21.09.92 : 08.92

Test oil

: ISO-4113

Combination no.

: 9 400 083 463

Injection pump

Pump designation PES6A950120RS2834 EP type number

: 9 400 084 032

Governor

Governor design.

: RSV400...1100A8C2259

-1R

Governer no.

: 9 420 083 261

Customer-spec. information Customer

: CUMMINS

Engine

: 6BT 5.9 L

1st version kW

: 108.0

Rated speed

: 2200

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 419 992 198

Inlet press., bar: 1.50

Test nozzle holder

assembly

: 0 681 343 009

Openina

pressure, bar

: 172...175

Test lines

: 1 680 750 014

Outside diameter

x Wall thickness

x Length mm

: 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 2.75...2.85 : (2.70...2.90)

Rack travel in mm : 9.00...12.00

Firing order

: 1-5-3-6-2-4

Phasing

: 0-60-120-180-240-300

Tolerance + - \*

: 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00

& maximum rack tra: 21.00

Difference \* CS : 2.00...3.00

BASIC SETTING

1st speed

rpm: 1100

Rack travel in mm : 10.90...11.00

Del.quantity cm3/: 8.4...8.6

100 s: (8.2...8.8)

Spread

cm3 : 0.3

100 s: (0.6)

2nd speed

rpm : 400.0

Rack travel in mm: 5.0...5.2

Del.quantity cm3/: 0.9...1.3

100 s: (0.7...1.5)

Spread

cm3 : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-Lever position

Degree: -3

Speed rpm : 800 Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 4.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

Spread

rpm : 1100

: 84.0...86.0

Del.quantity

1000

: (82.0...88.0)

: 3.50

cm3

: (6.00) 1000

RATED SPEED

1st version

Control lever

position degrees: 97...105

Testina:

1st rack travel in: 9.90

rpm : 1140...1150 Speed

2nd rack travel in: 4.00

rpm : 1175...1205 Speed

4th rack travel in: 1350

Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever

position degrees: 67...75

Setting point w/out bumper spring

Speed

rpm : 400

Rack travel in mm: 4.6

Testing:

Speed rpm : 100

Minimum rack trave: 19.00

Speed rpm : 400

Rack travel in mm : 5.00...5.20

Rack travel in mm : 2.00

Speed rpm : 490...550

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1100 Rack travel in m: 10.90...11.00

rpm : 700 2nd speed

Rack travel in m: 11.50...11.60

rpm : 900 3rd speed

Rack travel in m: 11.20...11.30

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 700 Del.quantity cm3/ : 92.5...94.5 1000 s: (90.5...96.5)

Speed rpm : 900

Del.quantity cm3/: 84.5...87.5

1000 s: (82.5...89.5)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 9.90

Speed rpm : 1140...1150

STARTING FUEL DELIVERY

: 100 Speed rpm

Del.quantity cm3/: 115.0...135.0 1000 s: (112.0...138.0) Rack travel in mm: 19.00...21.00

LOW IDLE

Speed rpm : 400

Rack travel in mm : 5.00...5.20 Del.quantity cm3/: 9.0...13.0

1000 s: (7.0...15.0)

Spread cm3 : 3.50

1000 s: (5.50)

Remarks:

: C.D.C # 3355079 APPLICATION

Tractor (tractor engines)

#### Note remarks

Test sheet : MWM 3,9 b 1
Edition : 21.09.92
Replaces : 08.92
Test oil : ISO-4113

Combination no. : 9 400 085 243

Injection pump

Pump designation : FES4A80D32ORS1282-1

EP type number : 9 400 083 097

Governor

Governor design. : RS350/1500A2B2073-2R

Governer no. : 9 420 083 194

Customer spec. information Customer : MwM

Engine : D 229-4

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

**Opening** 

pressure, bar : 172...175

Test lines : 1 680 750 003

Outside diameter x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.65...2.75

: (2.60...2.80)
Rack travel in mm : 9.00...12.00

Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - \* : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00

& maximum rack tra: 21.00

Difference \* CS : 4.00...5.00

BASIC SETTING

1st speed rpm: 1500

Rack travel in mm : 9.20...9.30

Del.quantity cm3/ : 5.8...5.9

100 s: (5.6...6.0)

Spread cm3 : 0.2

100 s: (0.4)

2nd speed rpm : 350.0 Rack travel in mm : 6.0...6.2

Del.quantity cm3/: 0.7...1.1

100 s: (0.5...1.2)

Spread cm3 : 0.2

100 s: (0.3)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm: 800 Rack travel in mm: 0.30...1.00

Governor spring pre-tension

Click setting x :?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm: 1500

Del.quantity : 58.0...59.0

1000 : (56.5...60.5)

Spread cm3 : 2.50

1000 : (4.00)

RATED SPEED

1st version

Control lever

position degrees: 60...68

Testina:

1st rack travel in: 8.20

Speed rpm : 1540...1550 2nd rack travel in: 4.00 rpm : 1585...1615 Speed 4th rack travel in: 1700 Speed rpm : 0.30...1.70LOW IDLE 1 Control lever position degrees: 28...36 Setting point w/out bumper spring nom : 350 Speed Rack travel in mm: 6.1 Testing: Speed rpm : 250 Minimum rack trave: 6.80 rpm : 350 Rack travel in mm : 6.00...6.20 Rack travel in mm : 4.00 rpm : 430...490 Speed Speed rpm : 550 Maximum rack trave: 3.20 TORQUE CONTROL Torque control curve - 1st version rpm : 1500 1st speed Rack travel in m: 9.20...9.30 2nd speed rpm : 500 Rack travel in m: 10.60...10.70 rpm : 900 3rd speed Rack travel in m: 10.20...10.40 4th speed rpm : 1200 Rack travel in m: 9.50...9.80 FUEL DELIVERY CHARACTERISTICS 1st version Speed rpm : 500 Del.quantity cm3/ : 58.5...60.5 1000 s: (56.5...62.5) Speed rpm : 900 Del.quantity cm3/: 63.0...65.0 1000 s: (61.0...67.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 8.20 Speed rpm : 1540...1550 STARTING FUEL DELIVERY rpm : 100

Remarks:

Rack travel in mm : 19.00...21.00

Note remarks

Test sheet : MB 6,0 g : 21.09.92 Edition Replaces : 08.89

Test oil : ISO-4113

: 9 400 085 305 Combination no.

Injection pump

Pump designation : PES6A95D41DRS2772 EP type number : 9 400 084 018

Governor

: RQV300...1300AB1066-Governor design.

: 9 420 080 265 Governor no.

Customer-spec. information

Customer : MERCEDES-BENZ

: OM 366 A **Engine** 

1st version kW : 125.0 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil

: 38...42 inlet temp. °C

Overflow valve

: 1 419 992 198

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

: 1 680 750 015 lest lines

Outside diameter x Wall thickness

x Length mm : 6.00x1.50x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.20...3.30

: (3.15...3.35)

Rack travel in mm : 9.00...12.00

: 1-5-3-6-2-4 Firing order

Phasing : 0-60-120-180-240-300

Tolerance + - \* : 0.50 (0.75)

BASIC SETTING

1st speed rpm: 1300

Rack travel in mm : 10.40...10.50

Del.quantity cm3/: 8.9...9.1

100 s: (8.7...9.3)

cm3 : 0.3Spread

100 s: (0.6)

2nd speed rpm : 300.0Rack travel in mm: 6.9...7.1 Del.quantity cm3/: 0.8...1.4 100 s: (0.6...1.6)

Spread cm3 : 0.3100 s: (0.5)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 300 1st speed : 0.80...1.30 travel mm

2nd speed : 500 rpm

travel mm 2.30...2.80

3rd speed : 750 rpm

travel mm : 4.10...4.30

: 1500 4th speed rpm

: 8.50...8.60 travel mm

GUIDE SLEEVE POSITION

Control-lever position Degree: -1

rpm : 1500 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 700

Del.quantity : 89.0...91.0 1000 : (87.0...93.0)

: 3.50 Spread cm3

1000 : (6.00)

RATED SPEED

1st version Control lever position degrees: 104...112 Testina: ist rack travel in: 9.40 rpm : 1340...1350 Speed 2nd rack travel in: 4.00 : 1460...1490 Speed LOW 4th rack travel in: 1630 Speed mpm : 0.00...1.00 LOW IDLE 1 Control lever position degrees: 64...72 Testing: Speed rpm : 100 Minimum rack trave: 8.00 rpm : 300 Rack travel in mm : 6.90...7.10 TORQUE CONTROL Dimension a mm : 0.50 Torque control curve - 1st version rpm : 1300 1st speed Rack travel in m: 10.40...10.50 2nd speed rpm : 800 Rack travel in m: 10.90...11.00 rpm : 1000 4th speed Rack travel in m: 10.60...10.80 Aneroid/Altitude Compensator Test 1st version Setting Speed : 500 rpm Pressure hPa : 700 Rack travel mm : 10.90...11.00 Measurement Speed 1/min: 500 1st pressure hPa : -Rack travel in m: 9.50...9.70 2nd pressure hPa : 450 Rack travel in m: 10.50...10.60 3rd pressure hPa : 300 Rack travel in m: 9.80...10.00 START CUT-OUT

1/min: 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version Aneroid pressure h: 700 Speed : 800 man Del.quantity cm3/: 86.0...89.0 1000 s: (83.5...91.5) Aneroid pressure h: 700 Speed rpm : 1000 Del.quantity cm3/: 88.0...91.0 1000 s: (85.5...93.5) Aneroid pressure h: rpm : 500 Speed Del.quantity cm3/: 59.0...61.0 1000 s: (57.0...63.0) **BREAKAWAY** 1st version 1mm rack travel less than

STARTING FUEL DELIVERY

Speed

full load rack tr: 9.40

COM

: 1340...1350

Speed

BOSCH INJ. PUMP TEST SPECIFICATIONS Rack traves in mm : 9.00...12.00 : 1-5-3-6-2-4 Firina order Note remarks Test sheet : MB 6,0 g 2 Edition : 21.09.92 Phasing : 0-60-120-180-240-300 Replaces : 09.91 Test oil : ISO-4113 Tolerance + - \* : 0.50 (0.08) Combination no. : 9 400 085 310 BASIC SETTING Injection pump rpm: 1300 1st speed Pump designation : PES6A950410RS2772 : 9 400 084 018 EP type number Rack travel in mm : 11.10...11.20 Governor Governor design. : RQV300...1300AB1066-Del.quantity cm3/: 9.8...10.0 8I\_ : 9 420 080 279 Governer no. 100 s: (9.6...10.2) Customer-spec, information cm3 : 0.3Spread Customer : MERCEDES-BENZ 100 s: (0.6) Engine : OM 366 LA rpm : 300.0 2nd speed 1st version kW : 155.0 Rack travel in mm: 6.9...7.1 Rated speed : 2600 Del.quantity cm3/: 0.8...1.4 100 s: (0.6...1.6) TEST BENCH REQUIREMENTS Spread cm3 : 0.3100 s: (0.5) Test oil inlet temp. °C : 38...42 (B) Setting of injection pump with governor Overflow valve : 1 419 992 198 GUIDE SLEEVE TRAVEL 1st speed rpm : 300 Inlet press., bar: 1.50 travel mm : 0.80...1.30 2nd speed : 500 rpm Test nozzle holder 2.30...2.80 travel mm : 0 681 343 909 : 750 assembly 3rd speed rom : 4.10...4.30 travel mm Openina 4th speed : 1500 man pressure, bar : 172...175 : 8.50...8.60 travel mm GUIDE SLEEVE POSITION Test Lines : 1 680 750 015 Control-lever position Degree: -1 rpm : 1500 Outside diameter Speed x Wall thickness Rack travel in mm : 15.20...17.80 x Length mm : 6.00x1.50x600 FULL LOAD DELIV. AT FULL LOAD STOP (A) Injection pump setting values Insp. values in parentheses 1st version Set equal delivery quant. Speed rom : 1300per values Aneroid pressure h: 700 Del.quantity : 98.0...100.0

1000 : (96.0...102.0)

: 3.50

: (6.00)

cm3

1000

Spread

RATED SPEED

BEGINNING OF DELIVERY Test pressure, bar: 25

Test pressure, bar: 25...27

Prestroke mm : 3.20...3.30

: (3.15...3.35)

1st version Control Lever

position degrees: 105...113

Testing:

1st rack travel in: 10.10

rpm : 1360...1370 Speed

2nd rack travel in: 4.00

rpm : 1485...1515 Speed

4th rack travel in: 1650

rpm : 0.00...1.00 Spaed

LOW IDLE 1

Control Lever

position degrees: 64...72

Testing:

: 100 Speed rom Minimum rack trave: 8.00 rpm : 300

Rack travel in mm : 6.90...7.10

Aneroid/Altitude Compensator Test

1st version

Setting

Speed rom : 500 hPa : 700 Pressure

Rack travel mm : 11.10...11.20

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 9.40...9.70

2nd pressure hPa : 450

Rack travel in m: 10.40...10.50

3rd pressure hPa : 300

Rack travel in m: 9.70...9.90

START CUT-OUT

1/min: 220 (240) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700 rpm : 700 Speed

Del.quantity cm3/: 86.0...89.0 1000 s: (83.5...91.5)

Aneroid pressure h: -: 500 Speed rpm

Del.quantity cm3/: 59.5...61.5

1000 s: (57.5...63.5)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 10.10

Speed rpm : 1360...1370

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 78.0...90.0 1000 s: (-)

:

Rack travel in mm : 13.60...13.80

Remarks:

**J22** 

Note remarks

Test sheet : MB 6,0 g 3 Edition : 21.09.92 Replaces : 10.91

Test oil : ISO-4113

Combination no. : 9 400 085 315

Injection pump

Pump designation : PES6A95D410RS2772 EP type number : 9 400 084 018

Governor

: RQV300...1300AB1066-Governor design.

: 9 420 080 282 Governer no.

Customer-spec. information

Customer : MERCEDES-BENZ

Engine : OM 366 A

1st version kW : 125.0 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 419 992 198

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening

: 172...175 pressure, bar

Test lines : 1 680 750 015

Outside diameter x Wall thickness

x Length mm : 6.00x1.50x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.20...3.30

: (3.15...3.35)

Rack travel in mm : 9.00...12.00

: 1-5-3-6-2-4 Firing order

Phasing : 0-60-120-180-240-300

Tolerance + - \* : 0.50 (0.75)

BASIC SETTING

rpm: 1300 1st speed

Rack travel in mm : 10.40...10.50

Del.quantity cm3/: 8.9...9.1

100 s: (8.7...9.3)

cm3 : 0.3Spread

100 s: (0.6)

rpm : 300.02nd speed Rack travel in mm : 6.9...7.1 Del.quantity cm3/: 0.9...1.5

100 s: (0.7...1.7)

Spread cm3 : 0.3100 s: (0.5)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 300 1st speed

: 0.80...1.30 travel mm 2nd speed rpm : 500

travel mm

: 2.30...2.80 3rd speed rpm : 750

travel mm

: 4.10...4.30

4th speed rpm : 1500

travel mm : 8.50...8.60

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

Speed rpm : 1500

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300Aneroid pressure h: 800

: 89.0...91.0 Del.quantity 1000 : (87.0...93.0)

: 3.50 Spread cm3

1000 : (6.00)

RATED SPEED

1st version Control lever

position degrees: 105...113

Testing:

1st rack travel in: 9.40

rpm : 1360...1370 Speed

2nd rack travel in: 4.00

: 1470...1500 Speed וחכרו

4th rack travel in: 1650

Speed rcm : 0.00...1.00

LOW IDLE 1

Control lever

position degrees: 64...72

Testina:

Speed : 100 rpm Minimum rack trave: 8.00

rpm : 300

Rack travel in mm : 6.90...7.10

TORQUE CONTROL

Dimension a mm : 0.50

Torque control curve - 1st version

rpm : 1300 1st speed

Rack travel in n: 10.40...10.50

rpm : 800 2nd speed

Rack travel in m: 10.90...11.00

4th speed rpm : 1000

Rack travel in m: 10.60...10.80

Ameroid/Altitude

Compensator Test

1st version

Sectina

Speed : 500 rpm Pressure hPa : 800

: 10.90...11.00 Rack travel mm

Measurement

 $1/\min : 500$ Speed

1st pressure hPa : -

Rack travel in m: 9.00...9.30

2nd pressure hPa : 460

Rack travel in m: 10.10...10.20

3rd pressure hPa : 300

Rack travel in m: 10.40...10.60

START CUT-OUT

1/min: 220 (240) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 800

: 800 Speed rpm

Del.quantity cm3/: 86.0...89.0 1000 s: (83.5...91.5)

Aneroid pressure h: 800

Speed rpm : 1000 Del.quantity cm3/ : 88.0...91.0 1000 s: (85.5...93.5)

Aneroid pressure h: -

rpm : 500 Speed

Del.quantity cm3/: 50.0...52.0

1000 s: (48.0...54.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 9.40

rpm : 1360...1370 Speed

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/ : 78.0...90.0

1000 s: (-)

Rack travel in mm : 13.60...13.80

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : MB 6,0 g 4 : 21.09.92 Edition Replaces : 08.91 Test oil : ISO-4113 : 9 400 085 317 Combination no. Injection pump Pump designation : PES6A95D410RS2772 EP type number : 9 400 084 018 Governor Governor design. : RQV300...1300AB1066-: 9 420 080 282 Governer no. Customer-spec, information Customer : MERCEDES-BENZ Engine : OM 365 A 1st version kW : 125.0 Rated speed : 2600 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 419 992 198 Inlet press., bar: 1.50 Test nozzle holder assembly : 0 681 343 (09 Openina pressure, bar : 172...175 Test lines : 1 680 750 015 Outside diameter x Wall thickness x Length mm : 6.00X1.50X600

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

: 3.20...3.30 : (3.15...3,35)

per values \_\_\_\_

Test pressure, bar: 25...27

BEGINNING OF DELIVERY

Prestroke mm

Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4 Phasing : 0-60-120-180-240-300 Tolerance + - \* : 0.50 (0.75) BASIC SETTING 1st speed rpm: 1300 Rack travel in mm: 10.40...10.50 Del.quantity cm3/: 8.9...9.1 100 s: (8.7...9.3) Spread cm3 : 0.3100 s: (0.6) rpm : 300.02nd speed Rack travel in mm : 6.9...7.1 Del.quantity cm3/: 0.9...1.5 100 s: (0.7...1.7) Spread cm3 : 0.3100 s: (0.5) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL 1st speed rpm : 300 travel mm : 0.80...1.30 2nd speed rpm : 500 : 2.30...2.80 travel mm rpm : 750 3rd speed travel mm : 4.10...4.30 : 1500 4th speed rpm : 8.50...8.60 travel mm GUIDE SLEEVE POSITION Control-lever position Degree: -1 Speed rpm : 1500 Rack travel in mm : 15.20...17.80 FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 1300 Aneroid pressure h: 800 Del.quantity : 89.0...91.0 1000 : (87.0...93.0) : 3.50 Spread cm3 1000 : (6.00) RATED SPEED

1st version Control lever position degrees: 105...113 Testing: 1st rack travel in: 9.40 rpm : 1360...1370 Speed 2nd rack travel in: 4.00 rpm : 1470...1500 Speed 4th rack travel in: 1650 rpm : 0.00...1.00 Speed LOW IDLE 1 Control lever position degrees: 64...72 Testing: rpm : 100 Speed Minimum rack trave: 8.00 rpm : 300 Rack travel in mm : 6.90...7.10 TORQUE CONTROL Dimension a mm : 0.50 Torque control curve - 1st version rpm : 1300 1st speed Rack travel in m: 10.40...10.50 2nd speed rpm : 800 Rack travel in m: 10.90...11.00 : 1000 4th speed rpm Rack travel in m: 10.60...10.80 Aneroid/Altitude Compensator Test 1st version Setting : 500 Speed rom Pressure hPa : 800 : 10.90...11.00 Rack travel mm Measurement 1/min : 500Speed 1st pressure hPa : -Rack travel in m: 9.00...9.30 2nd pressure hPa : 460 Rack travel in m: 10.10...10.20
3rd pressure hPa : 300
Rack travel in m: 9.40...9.60

1st version Aneroid pressure h: 800 rpm : 800 Speed Del.quantity cm3/: 86.0...89.0 1000 s: (83.5...91.5) Aneroid pressure h: 700 Speed rpm : 1000 Del.quantity cm3/: 88.0...91.0 1000 s: (85.5...93.5) Aneroid pressure h: -Speed rpm: 500 Del.quantity cm3/: 50.0...52.0 1000 s: (48.0...54.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 9.40 rpm : 1360...1370 Speed STARTING FUEL DELIVERY : 100 Speed rpm Del.quantity cm3/: 78.0...90.0 1000 s: (-) Rack travel in mm : 13.60...13.80 Remarks:

Speed

START CUT-OUT

1/min: 220 (240)

FUEL DELIVERY CHARACTERISTICS

Note remarks

Test sheet : MB 6,1 h
Edition : 21.09.92
Replaces : 04.91
Test oil : ISO-4113

Combination no. : 9 400 085 340

Injection pump

Pump designation : PES6A95D410RS2795 EP type number : 9 400 084 020

Governor

Governor design. : RSV350...1250A0B1150

-5L

Governer no. : 9 420 083 249

Customer-spec. information

Customer : MERCEDES-BENZ

Engine : 0M 366

1st version kW : 94.0 Rated speed : 2500

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

Opening

pressure, bar : 172...175

Test Lines : 1 680 750 015

Outside diameter

x Wall thickness

x Length wm : 6.00x1.50x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY
Test pressure, bar: 25...27

Prestroke mm : 3.20...3.30

: (3.15...3.35)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance + - \* : 0.50 (0.75)

BASIC SETTING

1st speed rpm: 1250

Rack travel in mm : 8.60...8.70

Del.quantity cm3/: 6.2...6.4

100 s: (6.0...6.6)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 350.0 Rack travel in mm : 6.9...7.1 Del.quantity cm3/: 0.9...1.5

100 s: (0.7...1.7)

Spread cm3 : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

Speed rpm: 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension Click setting x : 5.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm: 1250

Del.quantity : 62.5...64.5 1000 : (60.5...66.5)

Spread cm3 : 3.50

1000 : (6.00)

RATED SPEED

1st version Control lever

position degrees: 105...114

Testina:

1st rack travel in: 7.60

Speed rpm : 1290...1300

2nd rack travel in: 4.00

Speed rpm : 1332...1362

4th rack travel in: 1500

: 0.30...1.70 Speed mom

LOW IDLE 1 Control lever

position degrees: 78...86

Setting point w/out bumper spring

Speed rpm : 350 Rack travel in mm: 6.5

Testing:

Speed : 100 rpm Minimum rack trave: 19.00 : 350 MOLL

Rack travel in mm : 6.90...7.10

Rack travel in mm : 2.00

Speed rpm : 445...505

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1250

Rack travel in m: 8.60...8.70

2nd speed : 500 rpm

Rack travel in m: 8.60...8.80

5th speed rpm : 400

Rack travel in m: 9.80...10.40

## **EREAKAWAY**

1st version 1mm rack travel less than

full load rack tr: 7.60

Speed rpm : 1290...1300

STARTING FUEL DELIVERY

rpm : 100

Del.quantity cm3/: 90.0...110.0 1000 s: (87.0...113.0)

Rack travel in mm : 14.10...14.30

LOW IDLE

Speed rpm : 350

Rack travel in mm : 6.90...7.10 Del.quantity cm3/: 9.0...15.0 1000 s: (7.0...17.0) Spread cm3 : 3.50 1000 s: (5.50)

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4 Note remarks Test sheet : 21.09.92 Edition Phasing : 0-60-120-180-240-300 Replaces : 08.92 Test oil : ISO-4113 Tolerance + - " : 0.50 (0.08) Combination no. : 9 400 085 351 BASIC SETTING Injection pump 1st speed rpm: 1300 Pump designation : PES6A95D41ORS2772 EP type number : 9 400 084 018 Rack travel in mm : 11.10...11.20 Governor Governor design. : RQV300...1300AB1066-Del.quantity cm3/: 9.7...9.9 13L Governer no. : 9 420 080 332 100 s: (9.5...10.1) Customer-spec. information cm3 : 0.3Spread Customer : MERCEDES-BENZ 100 s: (0.6) : OM 366 LA Engine rpm : 300.0 2nd speed Rack travel in mm: 6.9...7.1 1st version kW : 147.0 Rated speed : 2600 Del.quantity cm3/: 0.8...1.4 100 s: (0.6...1.6) TEST BENCH REQUIREMENTS cm3 : 0.3Spread 100 s: (0.5) Test oil inlet temp. °C : 38...42 (B) Setting of injection pump with governor Overflow valve : 1 419 992 198 GUIDE SLEEVE TRAVEL rpm : 300 1st speed Inlet press., bar: 1.50 travel mm : 0.80...1.30 2nd speed rpm : 500 Test nozzle holder 2.30...2.80 travel mm assembly : 0 681 343 009 : 750 3rd speed rpm : 4.10...4.30 travel mm **Opening** : 1500 4th speed rpm pressure, bar : 172...175 travel mm : 8.50...8.60 GUIDE SLEEVE POSITION Test lines : 1 680 750 015 Control-lever position Degree: -1 Outside diameter rpm : 1500 Speed x Wall thickness Rack travel in mm : 15.20...17.80 x Length mm : 6.00x1.50x600 FULL LOAD DELIV. AT FULL LOAD STOP (A) Injection pump setting values Insp. values in parentheses 1st version Set equal delivery quant. Speed rpm : 1300 per values Aneroid pressure h: 700 : 97.0...99.0 Del.quantity BEGINNING OF DELIVERY 1000 : (95.0...101.0) Test pressure, bar: 25...27 Spread cm3 : 3.50 1000 : (6.00)

RATED SPEED

Prestroke mm

: 3.20...3.30 : (3.15...3.35) 1st version Control lever

position degrees: 106...114

Testina:

1st rack travel in: 10.10

Speed rpm : 1360...1370 2nd rack travel in: 4.00

rpm : 1490...1520 Speed

4th rack travel in: 1650

rpm : 0.00...1.00Speed

LOW IDLE 1

Control Lever

position degrees: 62...70

Testing:

Speed : 100 rom Minimum rack trave: 8.00 rpm : 300

Rack travel in mm : 6.90...7.10

CONSTANT REGULATION

rpm : 420...550 Speed

Aneroid/Altitude Compensator Test

1st version

Setting

Speed rpm : 500 hPa : 700 Pressure

Rack travel mm : 11.10...11.20

Measurement

Speed 1/min: 500

1st pressure hPa : -

Rack travel in m: 9.40...9.70

2nd pressure hPa : 500

Rack travel in m: 10.40...10.50

3rd pressure hPa : 350

Rack travel in m: 9.80...10.00

START CUT-OUT

1/min: 220 (240) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700

Speed rpm : 700 Del.quantity cm3/: 84.0...87.0

1000 s: (81.5...89.5)

Aneroid pressure h: -

rom : 500 Speed

K02

Del.quantity cm3/ : 59.0...61.0

1000 s: (57.0...63.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 10.10

Speed rpm : 1360...1370

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 85.0...97.0 1000 s: (-)

Rack travel in mm : 13.40...13.60

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4 Note remarks Test sheet : 21.09.92 Edition Phasina : 0-60-120-180-240-300 Replaces Test oil : ISO-4113 Tolerance + - ° : 0.50 (0.08) Combination no. : 9 400 085 353 BASIC SETTING Injection pump 1st speed rpm: 1300 Pump designation : PES6A950410RS2772 EP type number : 9 400 084 018 Rack travel in mm : 11.10...11.20 Governor : RQV300...1300AB1066-Governor design. Del.guantity cm3/: 9.8...10.0 : 9 420 080 279 Governer no. 100 s: (9.6...10.2) Customer-spec. information cm3 : 0.3Spread Customer : MERCEDES-BENZ 100 s: (0.6) Engine : 0M 366 LA rpm : 300.0 2nd speed 1st version kW : 155.0 Rack travel in mm: 6.9...7.1 Rated speed : 2600 Del.quantity cm3/: 0.8...1.4 100 s: (0.6...1.6) TEST BENCH REQUIREMENTS Spread cm3 : 0.3100 s: (0.5) Test oil inlet temp. °C : 38...42 (B) Setting of injection pump with governor Overflow valve : 1 419 992 198 GUIDE SLEEVE TRAVEL 1st speed rpm : 300 Inlet press., bar: 1.50 travel mm : 0.80...1.30 2nd speed rpm : 500 Test nozzle holder travel mm : 2.30...2.80 : 0 681 343 009 assembly : 750 3rd speed rpm : 4,10...4.30 travel mm Opening | : 1500 4th speed rpm pressure, bar : 172...175 travel mm : 8.50...8.60 GUIDE SLEEVE POSITION Test lines : 1 680 750 015 Control-lever position Degree: -1 Outside diameter rpm : 1500 Speed x Wall thickness Rack travel in mm : 15.20...17.80 x Length mm : 6.00X1.50X600 FULL LOAD DELIV. AT FULL LOAD STOP (A) Injection pump setting values Insp. values in parentheses 1st version Set equal delivery quant. Speed rpm : 1300 per values Aneroid pressure h: 700 : 98.0...100.0 Del.quantity BEGINNING OF DELIVERY 1000 : (96.0...102.0) Test pressure, bar: 25...27 : 3.50 Spread cm3 1000 : (6.00)

RATED SPEED

Prestroke mm

: 3.20...3.30

1st version Control Lever

position degrees: 104...112

Testing:

1st rack travel in: 10.10

Speed rpm : 1360...1370

2nd rack travel in: 4.00

rpm : 1485...1515 Speed

4th rack travel in: 1650

Speed rom : 0.00...1.00

LOW IDLE 1 Control lever

position degrees: 64...72

Testing:

: 100 Speed npm . Minimum rack trave: 8.00 rpm : 300 Speed

Rack travel in mm : 6.90...7.10

Aneroid/Altitude Compensator Test

1st version Setting

Speed rpm : 500 hPa : 700 Pressure

: 11.10...11.20 Rack travel mm

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 9.40...9.70

2nd pressure hPa : 450

Rack travel in m: 10.40...10.50

3rd pressure hPa : 300

Rack travel in m: 9.70...9.90

START CUT-OUT

1/min: 220 (240) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700 rpm : 700 Speed

Del.quantity cm3/: 86.0...89.0

1000 s: (83.5...91.5)

Aneroid pressure h: -: 500 Speed rpm

Del.quantity cm3/: 59.5...61.5

1000 s: (57.5...63.5)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 10.10

Speed rpm : 1360...1370

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 78.0...90.0 1000 s: (-)

Rack travel in mm : 13.60...13.80

Remarks:

**KO4** 

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

: VOL 10,0q15 : 21.09.92 Test sheet Edition

Replaces : 08.91

Test oil : ISO-4113

Combination no. : 9 400 087 437

Injection pump

Pump designation : PE6P11CA32CRS31CBY EP type number : 0 411 816 729

Governor

Governor design. : RQV250...1100PA589-3

: 9 420 080 288 Governer no.

Customer-spec. information Customer : VOLVO

: THD 100 EC Engine

1st version kW : 180.0 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press. bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening.

pressure, bar : 172...175

Test Lines : 1 680 750 015

Outside diameter x Wall thickness

x Length mm : 6.00x1.50x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.00...3.10

: (2.95...3.15)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 700

Rack travel in mm : 11.10...11.20

Del.quantity cm3/: 13.8...14.0

100 s: (13.5...14.3)

Spread cm3 : 0.4

100 s: (0.7)

rpm : 250.0 2nd speed

Rack travel in mm : 5.2...5.4 Del.quantity cm3/ : 3.0...3.4

100 s: (2.7...3.6)

Spread cm3 : 0.3100 s: (0.6)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250

travel mm : 1.10...1.30

2nd speed rpm : 500

travel mm : 4.10...4.90

rpm : 700 3rd speed

travel mm : 6.30...6.70

: 950 4th speed rom

travel mm : 6.30,...6.70

5th speed : 1100 rpm

travel mm : 7.00...7.50

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1175 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700 Aneroid pressure h: 900

Del.quantity : 750.0...143.0)

K05

Spread

: 4.00 cm3

1000 : (7.50)

RATED SPEED

1st version

Control lever

position degrees: 61...69

Testing:

1st rack travel in: 10.10

rpm : 1160...1170 Speed

2nd rack travel in: 4.00

rom : 1225...1255 Speed

4th rack travel in: 1350

: 0.00...1.00 Speed rom

LOW IDLE 1

Control lever

position degrees: 8...16

Testina:

Speed rpm : 100

Minimum rack trave: 6.70

Speed rpm

Rack travel in mm : 5.20...5.40

CONSTANT REGULATION

תוכרו : 250...425 Speed

Aneroid/Altitude

Compensator Test

1st version Settina

Speed : 500 rpm

hPa : 900 Pressure

: 11.10...11.20 Rack travel mm

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 9.60...9.80

2nd pressure hPa : 280

Rack travel in m: 9.80...9.90

3rd pressure hPa : 430

Rack travel in m: 10.90..11.10

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

rpm : 700 Speed

Del.quantity cm3/: 106.0...108.0

1000 s: (103.0...111.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.10

rpm : 1160...1170 Speed

STARTING FUEL DELIVERY

Speed T)T

Del.quantity cm3/: 170.0...200.0 1000 s: (166.0...204.0)

Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 250 Rack travel in mm : 5.20...5.40

Del.quantity cm3/: 30.0...34.0 1000 s: (27.5...36.5)

Spread cm3 : 3.60

1000 s: (6.00)

Remarks:

Delivery-valve spring pre-tension =

2.40...2.60 mm.

Permissible alteration from 2.20...2.90

**APPLICATION** 

**Omnibus** 

BOSCH INJ. FUMP TEST SPECIFICATIONS

Note remarks

Test sheet : VOL 10,0q16 : 21.09.92 Edition

Replaces : 10.90 Test oil : ISO-4113

Combination no. : 9 400 087 438

Injection pump

Pump designation : PE6P110A320RS3108X

EP type number : 0 411 816 730

Governor

Governor design. : RQV250...1100PA589-3

Governer no. : 9 420 080 288

Customer-spec. information Customer : VOLVO

Engine : THD100 ED

: 203.0 1st version kW : 2200 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

**Opening** 

pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter x Wall thickness

x Length mm : 6.00x1.50x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.00...3.10 : (2.95...3.15)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rom: 700 1st speed

Rack travel in mm : 12.10...12.20

Del.quantity cm3/: 16.0...16.2

100 s: (15.7...16.5)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 250.0Rack travel in mm : 5.0...5.2 Del.quantity cm3/ : 3.0...3.4 100 s: (2.7...3.6)

Spread cm3 : 0.3100 s: (0.6)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250 : 1.10...1.30 travel mm

rpm : 500 2nd speed : 4.10...4.90 travel mm

3rd speed rpm : 700

: 6.30...6.70 travel mm rpm : 950

4th speed travel mm : 6.30...6.70

5th speed rpm : 1100

travel mm : 7.00...7.50

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

Speed rpm : 1175

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed nom : 700 Aneroid pressure h: 900

Del.quantity : 100.0...165.0)

Spread cm3

: 4.00 1000 : (7.50)

#### RATED SPEED

1st version Control lever

position degrees: 61...69

Testing:

1st rack travel in: 11.10

Speed rom : 1160...1170 2nd rack travel in: 4.00

rpm : 1225...1255 Speed

4th rack travel in: 1350

Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever

position degrees: 8...16

Testing:

Speed : 100 rom Minimum rack trave: 6.70 : 250

rpm

Rack travel in mm : 5.00...5.20

CONSTANT REGULATION

rpm : 250...425 Speed

Aneroid/Altitude Compensator Test

1st version

Setting

Speed rom : 500 hPa : 900 Pressure

Rack travel am : 12.10...12.20

Measurement

Speed 1/min: 500

1st pressure hPa : -

Rack travel in m: 9.30...9.40

2nd pressure hPa : 280

Rack travel in m: 9.50...9.60

3rd pressure hPa : 700

Rack travel in m: 11.70...11.90

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

Speed rpm : 700 Del.quantity cm3/ : 106.0...108.0

1000 s: (103.0...111.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 11.10

rpm : 1160...1170 Speed

STARTING FUEL DELIVERY

Speed mom : 100

Del.quantity cm3/: 170.0...200.0 1000 s: (166.0...204.0)

Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 250

Rack travel in mm : 5.00...5.20

Del.quantity cm3/: 30.0...34.0 1000 s: (27.5...36.5)

Spread cm3 : 3.00

1000 s: (6.00)

Remarks:

Dalivery-valve spring pre-tension =

2.40...2.60 mm.

Permissible alteration from 2.20...2.90

**APPLICATION** 

Omnibus

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB

Edition : 21.08.92

Replaces

Test oil : ISO-4113

Combination no. : 9 400 087 468

Injection pump

Pump designation : PES5P120A720LS7174

EP type number : 0 412 725 806

Governor

Governor design. : RQV300...1050PA1041

Governer no. : 9 420 080 329

Customer-spec. information

Customer : MERCEDES-BENZ

Engine : OM449 A

1st version kW : 184.0 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 419 992 198

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 105 assembly

Openina

pressure, bar : 207...210

Test lines : 1 680 750 075

Outside diameter

x Wall thickness

: 8.00x2.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30

: (5.15...5.35)

Rack travel in mm : 9.00...12.00

: 1-3-5-4-2 Firing order

Phasing : 0-72-144-216-288

Tolerance + - " : 0.50 (0.75)

Time to cyl. no. : 5

BASIC SETTING

1st speed rpm: 600

Rack travel in mm: 13.90...14.10

Del.quantity cm3/: 19.3...19.5

100 s: (19.0...19.8)

cm3 : 0.5 Spread

100 s: (0.9)

2nd speed rpm : 300.0Rack travel in mm: 6.6...7.0 Del.quantity cm3/: 1.7...2.3

100 s: (1.4...2.6) cm3 : 0.8Spread

100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL 1st speed rpm : 300

1.20...1.60 travel mm

2nd speed 500 : תפרו

: 3.00...3.50 travel mm rpm : 900 3rd speed

travel mm : 5.60...6.10

4th speed rpm : 1100 travel mm

: 7.40...7.90 5th speed rpm : 1210

: 9.30...9.80 travel mm

GUIDE SLEEVE POSITION

Control-lever position Degree: -1

Speed rpm : 1140

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 700

: 193.5...195.5 Del.quantity

1000 : (190.5...198.5)

: 5.00 Spread cm3 : (9.00) 1000 RATED SPEED 1st version Control Lever position degrees: 111...119 Testina: 1st rack travel in: 13.70 rpm : 1090...1100 Speed 2nd rack travel in: 4.00 Speed rpm : 1180...1210 4th rack travel in: 1300 Speed rom : 0.00...1.50LOW IDLE 1 Control lever position degrees: 66...74 Testina: Speed : 100 rpm Minimum rack trave: 8.50 Speed : 300 **POM** Rack travel in mm : 6.70...6.90 CONSTANT REGULATION Speed : 380...320 rpm Aneroid/Altitude Compensator Test 1st version Setting Speed : 600 nom Pressure hPa : 700 Rack travel mn : 13.90...14.10 Measurement Speed  $1/\min : 600$ 1st pressure hPa : 340 Rack travel in m: 11.60...11.80 2nd pressure hPa : 520 Rack travel in m: 13.00...13.20 3rd pressure hPa : 960 Rack travel in m: 14.10...14.20 4th pressure hPa : 1040 Rack travel in m: 14.30...14.40 5th pressure hPa Rack travel in m: 10.80...11.10 START CUT-OUT Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version Aneroid pressure h: 1300 Speed man : 1050 Del.quantity cm3/: 208.5...211.5 1000 s: (205.5...214.5) cm3 : 8.00 Spread 1000 s: (12.0) Aneroid pressure h: 1300 Speed rpm Del.quantity cm3/: 209.0...213.0 1000 s: (206.0...216.0) Spread cm3 : 8.001000 s: (12.0) Aneroid pressure h: Speed rpm : 500 Del.quaritity cm3/ : 131.0...133.0 1000 s: (128.0...136.0) Spread cm3 : 8.00 1000 s: (12.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 13.70 Speed rpm : 1090...1100 STARTING FUEL DELIVERY Speed : 100 rpm Del.quantity cm3/: 197.0...217.0 1000 s: (193.0...221.0)

Remarks:

## BOSCH INJ. PUMP TEST SPECIFICATIONS

#### Note remarks

Test sheet : CAS 8,3 h 1 Edition : 12.10.92 Replaces : 20.6.88 Test oil : ISO-4113

Combination no. : 9 400 230 058

Injection pump

Pump designation : PES6A95D32OLS2647

Governor

Governor design. : RSV400...1100A2B2172

Customer-spec. information Customer : CASE

Engine : A 504 BDT

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 9 681 273 009

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

**Openina** 

pressure, bar : 172...175

Test lines : 9 681 230 706

Outside diameter x Wall thickness

x Length mm : 6,00X2,00X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Rack travel in mm: 10.50

Firing order : 1-5-3-6-2-4

Phasina : 0-60-120-180-240-300

Tolerance + - \* : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 9.60...9.70

Del.quantity cm3/: 10.4...10.6

100 s: (10.2...10.8)

cm3 : 0.35Suread

100 s: (0.60)

2nd speed rpm : 400

Rack travel in mm : 4.80...5.00 Del.quantity cm3/: 1.8...2.2 100 s: (1.5...2.4)

Spread cm3 : 0.35

100 s: (0.55)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

rpm : 800 Speed

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x :?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

: 104.5...106.5 Del.quantity 1000 : (102.5...108.5)

: 3.5 Spread cm3

1000 : (6.0)

RATED SPEED

1st version Control lever

position degrees: 46...54

Testing:

1st rack travel in: 8.60

Speed rpm : 1140...1150

2nd rack travel in: 4.00

Speed rpm : 1185...1215 4th rack travel in: 1300

Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever

position degrees: 26...34

Setting point w/out bumper spring

rpm : 400

Rack travel in mm: 4.40

Testina:

Soeed rpm : 100 Minimum rack trave: 19.00 Speed rpm : 400

Rack travel in mm : 4.80...5.00

Rack travel in mm : 2.00

Speed rpm : 525...585

TORQUE CONTROL

Torque control curve - 1st version 1st speed rpm : 1100 Rack travel in m: 9.60...9.70

2nd speed rpm : 750

Rack travel in m: 10.25...10.35

3rd speed rpm : 600

Rack travel in m: 10.20...:0.50

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 750

Del.quantity cm3/: 111.5...115.5

1000 s: (109.5...117.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 8.60

Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 140.00...150.00 1000 s: (137.0...153.0)

Remarks:

: CASE # A-182102

Start-of-delivery mark is at start of

delivery of cylinder 1

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : IHC 9,0 d 1 Edition : 12.10.92 Replaces : 7.86 Test oil : ISO-4113 Combination no. : 9 400 230 086 Injection pump Pump designation : PES8A95D32ORS2708 EP type number : 9 410 230 027 Governor Governor design. : RQV325...1400AB1213R Governer no. : 9 420 231 012 Customer-spec. information Customer : IHC Engine : D9L 1st version kW : 123.0 Rated speed : 2800 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 019 Inlet press., bar: 2.80 Test nozzle holder : 0 681 343 009 assembly **Opening** pressure, bar : 172...175 Test lines : 9 681 271 001

Outside diameter x Wall thickness x Length mm : 6,00x2,00x600 (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values BEGINNING OF DELIVERY Rack travel in mm : 10.50 Firing order : 1-8-7-3-6-5-4-2

: 0-45-90-135-180-225-Phasing 270-315 Tolerance + - ° : 0.50 (0.75) Time to cyl. no. : 1 BASIC SETTING 1st speed rpm: 1400 Rack travel in mm : 11.00...11.10 Del.quantity cm3/: 6.4...6.6 100 s: (6.2...6.8) Spread cm3 : 0.35100 s: (0.60) rpm : 350 2nd speed Rack travel in mm : 6.70...6.90 Del.quantity cm3/: 0.9...1.3 100 s: (0.6...1.5) cm3 : 0.35Spread 100 s: (0.55) **GUIDE SLEEVE POSITION** Control-lever position Degree: -1 rpm : 1580 Rack travel in mm: 8.00 FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 1400 : 64.0...66.0 Del.quantity 1000 : (62.0...68.0) : 3.5 Spread cm3 1000 : (6.0)RATED SPEED 1st version Control Lever position degrees: 62...70 Testing: 1st rack travel in: 10.00 Speed rpm : 1450...1460 2nd rack travel in: 4.00 rpm : 1550...1580 Speed 4th rack travel in: 1650 rpm : 0.00...1.00 Speed LOW IDLE 1

Control Lever

position degrees: 7...15

Testing:

Speed rpm : 100 Minimum rack trave: 8.00

Speed rpm : 350
Rack travel in mm : 6.70...6.90
Rack travel in mm : 2.00

Speed : 630...690 rom

TORQUE CONTROL

Dimension a mm : 0.50

Torque control curve - 1st version

1st speed rpm : 1100

Rack travel in m: 11.40...11.60

2nd speed rpm : 1300

Rack travel in m: 11.00...11.10

START CUT-OUT

1/min: 205...265 Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Speed : 840 rpm

Del.quantity cm3/: 55.0...58.0 1000 s: (52.5...60.5)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 10.00

rpm : 1450...1460 Speed

STARTING FUEL DELIVERY

Speed : 100 rpm

Del.quantity cm3/ : 180.0...

1000 s: (175.0...)

Remarks:

: CASE # A-182102

Start-of-delivery mark is at start of

delivery of cylinder 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 j7 Edition : 12.10.92 Replaces : 23.3.90

Replaces : 23.3.90 Test oil : ISO-4113

Combination no. : 9 400 231 241

Injection pump

Pump designation : PES6P120A720RS6016-1

Governor

Governor design. : RQV325...850PA721-5K

Cust. part ro. : \*

Customer—spec. information Customer : MACK

Engine : E6 400 4VH

TEST BENCH REQUIREMENTS

Test oil

inlet temp. \*C : 38...42

Overflow valve

: 2 417 413 011

Inlet press., bar: 0.2

Opening

pressure, bar : 295...305

Test lines : 9 681 230 735

Outside diameter x Wall thickness

x Length mm : 6.35x1.70x838.2

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Prestroke mm : 2.95...3.05

: (2.90...3.10)

Rack travel in mm: 10.50

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance + - \* : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 850

Rack travel in mm : 13.20...13.30

Del.quantity cm3/: 18.3...18.5

100 s: (18.0...18.9)

Spread cm3 : 0.5

100 s: (0.75)

2rid speed rpm : 325

Rack travel in mm : 4.70...4.90 Del.quantity cm3/ : 3.0...3.4

100 s: (2.8...3.6)

Spread cm3 : 1.0

100 s: (1.2)

GUIDE SLEEVE POSITION Control-lever position

Degree: -1 Speed rpm : 1020

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm: 850

Del.quantity : 183.0...185.0 1000 : (180.0...189.0)

cm3 : 5.0

1000 : (7.5)

RATED SPEED

Spread

1st version

Control lever

position degrees: 52...58

Testing:

1st rack travel in: 12.20

Speed rpm : 890...900 2nd rack travel in: 4.00

Speed rpm : 995...1025

4th rack travel in: 1050

Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever

position degrees: 10...16

Testing:

Speed rpm : 250 Minimum rack trave: 6.60 Speed rpm : 325 Rack travel in mm : 4.70...4.90 Rack travel in mm : 2.00

: 430...490 Speed rom

TORQUE CONTROL

Dimension a mm : 0.60

Torque control curve - 1st version

1st speed rpm : 850

Rack travel in m: 13.20...13.30

2nd speed rpm : 700

Rack travel in m: 13.40...13.50

3rd speed rpm : 600

Rack travel in m: 13.80...13.90

4th speed rpm : 500

Rack travel in m: 13.20...13.30

### FUEL DELIVERY CHARACTERISTICS

1st version

rpm : 700 Speed

Del.quantity cm3/: — 1000 s: (193.5...205.5)

Speed rpm : 600

Del.quantity cm3/: 213.0...219.0 1000 s: (210.0...222.0)

#### **BREAKAWAY**

1st version 1mm rack travel less than

full load rack tr: 12.20 Speed rpm : 890...900

STARTING FUEL DELIVERY

: 100 Speed rom

Del.quantity cm3/: 160.0...200.0 1000 s: (150.0...210.0)

#### LOW IDLE

Speed rpm : 325 Del.quantity cm3/ : 30.0...34.0 1000 s: (28.0...36.0)

#### Remarks:

See VDT-I-MAC 002

PLE dimension = 0.740'' - 0.820''

The test specifications apply to testing of the injection-pump assembly with the genuine engine/nozzle-and-holder assembly

#### Note remarks

Test sheet

: KHD : 21.69.92

Edition

Replaces

Test oil

: ISO-4113

Combination no.

: 0 401 840 734AC

Injection pump

Pump designation : PE12P110A920LS3173

EP type number

: 0 411 810 708

Governor

Governor design. : RQV300...1075PA746

Governer no.

: 0 421 813 477

Customer

Customer-spec. information : KHD

Engine

: BF12L513

1st version kW

: 270.0

Rated speed

: 2150

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly

: 0 681 343 009

Opening

pressure, bar

: 172...175

Test lines

: 1 680 750 015

Outside diameter

x Wall thickness

x Length mm

: 6.00x1.50x600

(A) Injection pump setting values

Insp. values in parentheses

Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Prestroke mm

: 2.80...2.90

Rack travel in mm : 9.00...12.00

: (2.75...2.95)

Firing order

: 1- 4- 9- 8- 5- 2-

K17

Phasina : 0-15-60-75-120-135-

180-195-240-235-300-

315

Tolerance + - °

: 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed

rpm: 1075

Rack travel in mm : 9.80...9.90

Del.quantity cm3/: 10.2...10.6

100 s: (9.9...10.8)

Spread

Spread

cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 300.0

Rack travel in mm: 6.6.. 6.8

Del.quantity cm3/: 1.4...2.0

100 s: (1.1...2.2) cm3 : 0.4

100 s: (0.7)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

1st speed

rpm : 300

travel mm : 1.30...1.40

: 380

2nd speed rpm

2.30...2.70

travel mm 3rd speed rpm

: 430

travel mm

2.80...3.30

4th speed travel mm

: 700 rpm : 5.30...5.60

5th speed

: 1120 rpm

: 8.40...8.60 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1120

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

Speed

rpm : 1075

Del.quantity 1000 : 102.0...106.0

: (99.5...108.5)

Spread cm3: 4.00

1000 : (7.50)

RATED SPEED

1st version Control lever

position degrees: 50...58

Testing:

1st rack travel in: 8.80

rpm : 1115...1125 Speed

2nd rack travel in: 5.50

Speed rpm : 1140...1170

4th rack travel in: 1350

rom : 0.00...1.00Speed

LOW IDLE 1

Control lever

position degrees: 15...23

Testing:

Speed rom : 100

Minimum rack trave: 8.20

Speed rpm : 300 Rack travel in mm : 6.60...6.80

CONSTANT REGULATION

rpm : 315...465 Speed

TORQUE CONTROL

Dimension a mm

Torque control curve - 1st version

1st speed rpm : 1075

Rack travel in m: 9.80...9.90

2nd speed rpm : 650

Rack travel in m: 9.80...10.00

START CUT-OUT

1/min: 220 (240) Speed

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 8.80

rpm : 1115...1125 Speed

STARTING FUEL DELIVERY

Speed : 100 COM

Del.quantity cm3/: 135.0...165.0 1000 s: (131.0...169.0)

Remarks:

Check electrically unlatched starting fuel delivery (EES) with 24 volt.

On activation of the starting solenoid, the start position must be reached.

K18

#### Note remarks

Test sheet : KHD

Edition : 21.09.92

Replaces : -

Test oil : ISO-4113

Combination no. : 0 401 840 734AD

Injection pump

Pump designation : PE12P110A920LS3173

EP type number : 0 411 810 708

Governor

Governor design. : RUV300...1075PA746

Governer no. : 0 421 813 477

Customer-spec. information

Customer : KHD

Engine : BF12L513

1st version kW : 294.0

Rated speed : 2150

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

**Openina** 

pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter

x Wall thickness

x Length mm : 6.00X1.50X600

(A) Injection pump setting values

Insp. values in parentheses

Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Prestroke mm : 2.80...2.90

: (2.75...2.95)

Rack travel in mm : 9.00...12.00

Firing order : 1- 4- 9- 8- 5- 2-

K19

Phasing : 0-15-60-75-120-135-

180-195-240-255-300-

315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1075

Rack travel in mm: 10.40...10.50

Del.quantity cm3/: 11.3...11.7

100 s: (11.0...11.9)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed \_ rpm : 300.0

Rack travel in mm: 6.6...6.8

Del.quantity cm3/: 1.4...2.0 100 s: (1.1...2.2)

Spread cm3 : 0.4

100 s: (0.7)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

1st speed rpm: 300

travel mm : 1.30...1.40

2nd speed rpm : 380

travel mm : 2.30...2.70

3rd speed rpm : 430

travel mm : 2.80...3.30

4th speed rpm : 700

travel mm : 5.30...5.60

5th speed rpm : 1120

travel mm : 8.40...8.60

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

Speed rpm: 1120

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm: 1075

Del.quantity : 113.0...117.0

1000 : (110.5...119.5)

Spread cm3 : 4.00

1000 : (7.50)

RATED SPEED

1st version Control lever

position degrees: 50...58

Testina:

1st rack travel in: 9.40

Speed rpm: 1115...1125
2nd rack travel in: 5.50
Speed rpm: 1145...1175
4th rack travel in: 1350

rpm : 0.00...1.00Speed

LOW IDLE 1

Control lever

position degrees: 15...23

Testing:

rpm Speed : 100 Minimum rack trave: 8.20 Speed rpm : 300

Rack travel in mm : 6.60...6.80

CONSTANT REGULATION

rpm : 315...465 Speed

TORQUE CONTROL

Torque control curve - 1st version

rpm : 1075 1st speed

Rack travel in m: 10.40...10.50

2nd speed : 650 rom

Rack travel in m: 10.40...10.60

START CUT-OUT

Speed 1/min: 220 (240)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 9.40

rpm : 1115...1125 Speed

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 135.0...165.0

1000 s: (131.0...169.0)

Remarks:

Check electrically unlatched starting fuel delivery (EES) with 24 volt.

On activation of the starting solenoid, the start position must be reached.

K20

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 2,5 k39 Edition : 27.10.92 : 08.10.91 Replaces

Test oil : ISO-4113

Combination no. : 0 400 075 929

Injection pump

Pump designation: PES5M55C320RS177 EP type number : 0 410 055 974

Governor

Governor design. : RSF34C/23COM64-18

: 0 420 021 159 Governer no.

Cust. part no. : T4

Customer-spec. information Customer : MB-FKW

Engine : OM602A-USA

1st version kW : 92.0

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 469 990 351

Inlet press., bar: 1.00

Test nozzle holder

: 0 681 343 009 assembly

Openina |

pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter x Wall thickness

: 6.00X2.00X600 x Lenath mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY Test pressure, bar: 30...32

Prestroke mm : 1.70...1.80

: (1.65...1.85)

Rack travel in mm : 20.00...22.00

Firing order : 1-2-4-5-3

Phasing : 0-72-144-216-288

Tolerance + - \* : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1000

Rack travel in mm : 13.70...13.80

Del.quantity cm3/ : 5.1...5.2

100 s: (5.0...5.3)

cm3 : 0.2Spread

100 s: (0.3)

2nd speed rpm : 315.0 Rack travet in mm : 5.4...5.6 Del.quantity cm3/: 0.5...0.6

100 s: (0.4...0.85)

Spread cm3 : 0.1

100 s: (0.15)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000 Aneroid pressure h: 1850

Del.quantity : 51.0...52.0

1000 : (50.0...53.0)

: 2.50 Spread cm3 1000 : (3.00)

RATED SPEED

1st version

Control Lever

position degrees: 50...0 3rd rack travel in: 8,5..8,9 Speed rpm : 2500

4th rack travel in: 2950

rpm : 0.00...1.00 Speed

SET IDLE CONTROL LEVER

POSITION

LDW : 1000 Rack travel in mm : 1,7...1,8

LOW IDLE 1 Control lever

position degrees: 812 Setting point w/out bumper spring Speed rpm : 315 Rack travel in mm : 5.5  Testing: Speed rpm : 220 Minimum rack trave: 8.00 Speed rpm : 315 Rack travel in mm : 5.405.60 Rack travel in mm : 2.50	Del.quantity cm3/: 48.550.5 1000 s: (47.551.5) Spread cm3 : 2.50 1000 s: (3.00) Ancroid pressure h: 1050 Speed rpm : 1000 Del.quantity cm3/: 33.034.0 1000 s: (32.035.0) Spread cm3 : 2.50 1000 s: (3.00)
Speed rpm : 520620 Speed rpm : 1000 Maximum rack trave: 1.80	T STARTING FUEL DELIVERY
SET IDLE AUXILIARY SPRING Speed rpm : 380 Rack travel in mm : 4,24,4 : (4,14,5)	Speed rpm : 100 
TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1000 Rack travel in m: 13.7013.80 2nd speed rpm : 1600 Rack travel in m: 13.0013.20 3rd speed rpm : 2200 Rack travel in m: 12.2012.40 Aneroid/Altitude Compensator Test	HIGH IDLE  1st version Aneroid pressure h: 1850 Speed rpm : 2500 Rack travel in mm : 8.508.90 Det.quantity cm3/: 29.033.0 1000 s: (28.034.0) Spread cm3 : 2.50 1000 s: (3.00)
Compensator lest	LOW IDLE
1st version Setting Speed rpm : 1000 Pressure hPa : 1600 Rack travel mm : 0.300.70	Speed rpm: 315 Rack travel in mm: 5.405.60 Del.quantity cm3/: 5.06.0 1000 s: (4.08.5) Spread cm3: 1.00 1000 s: (1.50)
Measurement Speed 1/min: 1000	SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)
1st pressure hPa : 1050 Rack travel in m: 3.403.60 2nd pressure hPa : 750 Rack travel in m: 4.905.30 FUEL DELIVERY CHARACTERISTICS	Control lever at idle stop Speed rpm : 340 Rack travel in mm : (12.714.1) Del.quantity cm3/: - 1000 s: (41.049.0) Current A : 1.8
1st version Aneroid pressure h: 1850 Speed rpm : 1600 Del.quantity cm3/ : 49.551.0	Control lever at full-load stop Speed rpm : 2950 Rack travel in mm : 0.01.0 Current short-duration A : 3.0 Starting test Speed rpm : 100 Del.quantity cm3/:- min. 1000 s: 52.0 1,8A

Remarks:

Sliding sleeve pre-travel = 6.5 mm

CHECKING THE IDLE—SPEED AUXILIARY SPRING CUTOFF
—Control—lever position 35,5°, max.

0.2 mm control—rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.
—Control—lever position 33.0°, control—rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

TESTING PNEUMATIC SHUTOFF DEVICE—Control lever at idle stop. With n = 315 1/min. and pu = 450 mbar, control rod must move quickly to control—rod travel = 0 mm

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 16.8°...17.2° (16.7...17.3°) angular displacement of cam following start of delivery of cylinder no. 1.

Pin projection = 16.60...16.70 mm

CORRECTION OF INJECTED-FUEL QUANTITY Set max. change plus/minus 0.75 mm control-rod travel at correction screw on ALDA pressure box.

Testing and adjusting the control-rodtravel sensor with evaluation circuit KDEP-P400

Receiving inspection
Shift control lever to full-load stop.
Set 13.5 V at stabilizer. Apply
1850 hPa to ALDA. Run up to speed of
1000 1/min; a voltage of 2.457...2.517
(2.427...2.547) V must be displayed
on the digital voltmeter.

Adjustment of the control-rod travel sensor

At a speed of 1000 1/min, set fuel delivery at 21.0...22.0 (20.0...23.0)

ccm/1000 strokes with control lever. Shift control-rod-travel sensor until U = 1.633...1.639 (1.635...1.637) V is indicated. Tighten fastening screws with 1...2 Nm. Control lever to full-load stop; voltage value of 2.457... 2.517 V must be attained.

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : ME : 01.09.92 Edition Replaces Test oil : ISO-4113 Combination no. : 0 400 075 929 Injection pump Pump designation : PES5M55C32URS177 EP type number : 0 410 055 974 Governor Governor design. : RSF340/2300M64-18 : 0 420 021 159 Governer no. Cust. part no. : T8 Customer-spec. information Customer : MB-PKW : OM602A-USA ALDA Engine 1st version kW : 92.0 TEST BENCH REQUIREMENTS Test oil : 38...42 inlet temp. °C Overflow valve : 1 469 990 351 Inlet press., bar: 1.00 Test nozzle holder : 1 688 901 111 assembly Opening pressure, bar : 147...150 Test lines : 1 680 750 014 Outside diameter x Wall thickness : 6.00x2.00x600 x Length mm (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values \_\_\_\_ BEGINNING OF DELIVERY

Rack travel in mm : 20.00...22.00 Firing order : 1-2-4-5-3 Phasina : 0-72-144-216-288 Tolerance + - \* : 0.00 (1.00) Time to cyl. no. : 1 BASIC SETTING rom : 10001st speed Rack travel in mm : 13.70...15.80 Del.quantity cm3/: 5.1...5.2 100 s: (5.0...5.3) cm3 : 0.2Spread 100 s: (0.3) rpm : 315.0 2nd speed Rack travel in mm: 5.4...5.6 Del.quantity cm3/: 0.6...0.7 100 s: (0.5...0.9) cm3 : 0.1Spread 100 s: (0.1) FULL LOAD DELIV. AT FULL LOAD STOP 1st version rpm : 1000 Speed Aneroid pressure h: 1850 **:** 51.7...52.7 Del.quantity 1000 : (50.7...53.7) : 2.50 Spread cm3 1000 : (3.00) RATED SPEED 1st version Control lever position degrees: 50...0 3rd rack travel in: 8,5...8,9 rpm : 2500 Speed 4th rack travel in: 2950 rpm : 0.00...1.00Speed SET IDLE CONTROL LEVER **POSITION** : 1000 rpm Rack travel in mm: 1,7...1,8 LOW IDLE 1

Control lever

Prestroke mm

Test pressure, bar: 30...32

: 1.70...1.80

: (1.65,..1.85)

position degrees: 812 Setting point w/out bumper spring Speed rpm : 315 Rack travel in mm : 5.5  Testing: Speed rpm : 220 Minimum rack trave: 8.00 Speed rpm : 315 Rack travel in mm : 5.405.60 Rack travel in mm : 2.50	Del.quantity cm3/: 48.550.5 1000 s: (47.551.5) Spread cm3 : 2.50 1000 s: (3.00) Aneroid pressure h: 1050 Speed rpm : 1000 Del.quantity cm3/: 34.035.0 1000 s: (33.036.0) Spread cm3 : 2.50 1000 s: (3.00)
Speed rpm : 520620 Speed rpm : 1000 Maximum rack trave: 1.80	STARTING FUEL DELIVERY
SET IDLE AUXILIARY SPRING Speed rpm : 380 Rack travel in mm : 4,204,40 : (4,104,50)	Speed rpm : 100 Del.quantity cm3/ : 54.00.0 1000 s: (54.00.0) Rack travel in mm : 20.100.00
TORQUE CONTROL  Torque control curve - 1st version  1st speed rpm : 1000 Rack travel in m: 13.7013.80  2nd speed rpm : 1600 Rack travel in m: 13.0013.20  3rd speed rpm : 2200 Rack travel in m: 12.2012.40  Aneroid/Altitude Compensator Test	HIGH IDLE  1st version Aneroid pressure h: 1850 Speed rpm : 2500 Rack travel in mm: 8.508.90 Del.quantity cm3/: 30.034.0 1000 s: (29.035.0) Spread cm3 : 2.50 1000 s: (3.00)
	LOW IDLE
1st version Setting Speed rpm : 1000 Pressure hPa : 1600 Rack travel mm : 0.300.70	Speed rpm : 315 Rack travel in mm : 5.405.60 Del.quantity cm3/ : 6.07.0 1000 s: (5.09.5) Spread cm3 : 1.00 1000 s: (1.50)
Measurement Speed 1/min: 1000	SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)
1st pressure hPa : 1050 Rack travel in m: 3.403.60 2nd pressure hPa : 750 Rack travel in m: 4.905.30 FUEL DELIVERY CHARACTERISTICS	Control lever at idle stop  Speed rpm : 340  Rack travel in mm : (12,714,1)  Del.quantity cm3/: -  1000 s: (42,550,5)  Current A : 1,8
1st version Aneroid pressure h: 1850 Speed rpm : 1600 Del.quantity cm3/: 50.051.5	Control lever at full-load stop Speed rpm : 2950 Rack travel in mm : 0,01,0 Current short-duration A : 3,0 Starting test Speed rpm : 100 Del.quantity cm3/:- min. 1000 s: 54,0 1,8A

Remarks:

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 16.8°...17.2° (16.7...17.3°) angular displacement of cam following start of delivery of cylinder no. 1.

Difference in start of delivery between max. and min. value = max. 1° angular displacement of cam

Pin projection = 16.60...16.70 mm

Testing and adjusting the control-rodtravel sensor with evaluation circuit KDEP-P400

Receiving inspection
Shift control lever to full-load stop.
Set 13.5 V at stabilizer. Apply
1850 hPa to ALDA. Run up to speed of
1000 1/min; a voltage of 2.457...2.517
(2.427...2.547) V must be displayed on the digital voltmeter.

# Adjustment of the control-rod travel sensor

At a speed of 1000 1/min, set fuel delivery at 21,5...22,5 (20,5...23,5) ccm/1000 strokes with control lever. Shift control-rod-travel sensor until U = 1.633...1.639 (1.635...1.637) V is indicated. Tighten fastening screws with 1...2 Nm. Control lever to full-load stop; voltage value of 2.457... 2.517 V must be attained.

CORRECTION OF INJECTED-FUEL QUANTITY -Set max. change plus/minus 0.75 mm control-rod travel at correction screw on ALDA pressure box.

Sliding sleeve pre-travel = 6.5 mm

CHECKING THE IDLE—SPEED AUXILIARY SPRING CUTOFF
-Control-lever position 35,5°, max.
0.2 mm control-rod travel deduction allowable after switchover point (of

starting cam) up to 1000 1/min.
-Control-lever position 33.0°,
control-rod travel deduction must be
greater than 0.2 mm after switchover
point (of starting cam).

TESTING PNEUMATIC SHUTOFF DEVICE
-Control lever at idle stop.
With n = 315 1/min. and pu = 450 mbar,
control rod must move quickly to
control-rod travel = 0 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks : MB 2,5 W40 : 23.10.92 Test sheet Edition : 11.10.91 Replaces Test oil : ISO-4113 Combination no. : 0 400 075 930 Injection pump Pump designation : PES5M55C32ORS177 EP type number : 0 410 055 974 Covernor Governor design. : RSF340/2300M74-1 : 0 420 021 156 Governer no. Cust. part no. : T4 Customer-spec. information Customer : MB-PKW Engine : UM602A-D/A (KAT) 1st version kW : 92.0 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 469 990 351 Inlet press., bar: 1.00 Test nozzle holder assembly : 0 681 343 009 Openina pressure, bar : 172...175 Test lines : 1 680 750 014 Outside diameter x Wall thickness x Length mm : 6.00x2.00x600 (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values \_\_\_\_ BEGINNING OF DELIVERY Test pressure, bar: 30...32

: 1.70...1.80

: (1.65...1.85)

Rack travel in mm : 20.00...22.00 Firing order : 1-2-4-5-3 Phasing : 0-72-144-216-288 Tolerance + - \* : 0.00 (1.00) Time to cyl. no. : 1 BASIC SETTING 1st speed rpm: 1000 Rack travel in mm : 13.70...13.80 Del.quantity cm3/: 5.1...5.2 100 s: (5.0...5.3) cm3 : 0.2Spread 100 s: (0.3) rpm : 345.0 2nd speed Rack travel in mm: 5.5...5.7 Del.quantity cm3/: 0.5...0.6 100 s: (0.4...0.85) Spread cm3 : 0.1100 s: (0.15) FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 1000 Aneroid pressure h: 1850 Del.quantity : 51.0...52.0 1000 : (50.0...53.0) cm3 : 2.50 Spread 1000 : (3.00) RATED SPEED 1st version Control lever position degrees: 50...0 3rd rack travel in: 8.5...8.9 Speed rpm : 2500 4th rack travel in: 2950 rpm : 0.00...1.00Speed SET IDLE CONTROL LEVER POSITION : 1000 rpm Rack travel in mm: 1.7...1.8 LOW IDLE 1

Control lever

Prestroke mm

position degrees: 812 Setting point w/out bumper spring Speed rpm : 345 Rack travel in mm : 5.6  Testing: Speed rpm : 150 Minimum rack trave: 10 +1 Speed rpm : 345 Rack travel in mm : 5.505.70	Del.quantity cm3/: 48.550.5 1000 s: (47.551.5) Spread cm3 : 2.50 1000 s: (3.00) Aneroid pressure h: 1050 Speed rpm : 1000 Del.quantity cm3/: 33.034.0 1000 s: (32.035.0) Spread cm3 : 2.50 1000 s: (3.00)
Rack travel in mm : 2.50 Speed rpm : 550650 Speed rpm : 1000 Maximum rack trave: 1.80	STARTING FUEL DELIVERY
SET IDLE AUXILIARY SPRING Speed rpm : 400 Rack travel in mm : 4.24.4 : (4,14,5)	Speed rpm : 100 - Del.quantity cm3/ : 52.00.0 - 1000 s: (52.00.0) - Rack travel in mm : 20.100.00
TORQUE CONTROL  Torque control curve - 1st version  1st speed rpm : 1000  Rack travel in m: 13.7013.80  2nd speed rpm : 1600  Rack travel in m: 13.0013.20  3rd speed rpm : 2200  Rack travel in m: 12.2012.40  Aneroid/Altitude  Compensator Test	HIGH IDLE  1st version Aneroid pressure h: 1850 Speed rpm : 2500 Rack travel in mm : 8.508.90 Del.quantity cm3/ : 29.033.0 1000 s: (28.034.0) Spread cm3 : 2.50 1000 s: (3.00)
Compensator 165t	LOW IDLE
1st version Setting Speed rpm : 1000 Pressure hPa : 1600 Rack travel nm : 0.300.70 Measurement	Speed rpm : 345 Rack travel in mm : 5.505.70 Del.quantity cm3/ : 5.06.0 1000 s: (4.03.5) Spread cm3 : 1.00 1000 s: (1.50)
Speed 1/min: 1000	SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)
1st pressure hPa : 1050 Rack travel in m: 3.403.60 2nd pressure hPa : 750 Rack travel in m: 4.905.30 FUEL DELIVERY CHARACTERISTICS	Control lever at idle stop Speed rpm : 370 Rack travel in mm : (10,011.4) Del.quantity cm3/: - 1000 s: (27.535.5) Current A : 1.8
1st version Aneroid pressure h: 1850 Speed rpm : 1600 Del.quantity cm3/ : 49.551.0 1000 s: (48.552.0) Spread cm3 : 2.50 1000 s: (3.0) Aneroid pressure h: 1850 Speed rpm : 2200	Control lever at full-load stop Speed rpm : 2950 Rack travel in mm : 0.01.0 Current short-duration A : 3.0 Starting test Speed rpm : 100 Del.quantity cm3/:- min. 1000 s: 52,0 1.8A

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BOSCH INJ. PUMP TEST SPECIFICATIONS Rack travel in mm : 20.00...22.00 Firing order : 1-2-4-5-3 Note remarks Test sheet : MB Edition : 27.10.92 Phasing : 0-72-144-216-288 Replaces : 01.09.92 Test oil : ISO-4113 Tolerance + -- 2 : 0.00 (1.00) Combination no. : 0 400 075 930 Time to cyl. no. : 1 Injection pump BASIC SETTING Pump designation : PES5M55C32OR3177 EP type number : 0 410 055 974 1st speed rpm: 1000 Governor Governor design. : RSF340/2300M74-1 Rack travel in mm: 13.70...13.80 : 0 420 021 156 Governer no. Del.quantity cm3/ : 5.1...5.2 Cust. part no. : T8 100 s: (5.0...5.3) Customer-spec. information Customer : MB-PKW Spread cm3 : 0.2Engine : OMEOZA-D/A (KAT) 100 s: (0.3) 1st version kW : 92.0 2nd speed rpm : 345.0Rack travel in mm : 5.5...5.7 Del.quantity cm3/ : 0.6...0.7 TEST BENCH REQUIREMENTS 100 s: (0.5...0.9) cm3 : 0.1 Test oil Spread inlet temp. °C : 38...42 100 s: (0.1) Overflow valve FULL LOAD DELIV. AT FULL LOAD STOP : 1 469 990 351 1st version Inlet press., bar: 1.00 Speed rpm : 1000 Aneroid pressure h: 1850
Del.quantity : 51.7...52.7
1000 : (50.7...53.7) Test nozzle holder assembly : 1 688 901 111 Spread cm3 : 2.50 1000 : (3.00) Openina pressure, bar : 147...150 RATED SPEED Test Lines : 1 680 750 014 1st version Control lever Outside diameter position degrees: 50...0 x Wall thickness 3rd rack travel in: 8,5...8,9 Speed rpm : 2500 x Length mm : 6.00X2.00X600 4th rack travel in: 2950 (A) Injection pump setting values rpm : 0.00...1.00Speed Insp. values in parentheses Set equal delivery quant. SET IDLE CONTROL LEVER per values POSITION BEGINNING OF DELIVERY rpm Test pressure, bar: 30...32 Rack travel in mm : 1,7...1,8 : 1.70...1.80 : (1.65...1.85) Prestroke mm LOW IDLE 1 Control lever

position degrees: 8...12 FD<270 Rack travel in m: 3.40...3.60 Setting point w/out bumper spring 2nd pressure hPa : 750 rpm Rack travel in m: 4.90...5.30 Rack travel in mm: 5.6 FUEL DELIVERY CHARACTERISTICS Testing: Speed : 150 \* rpm Minimum rack trave: 10.0+1 1st version Speed : 345 rom Aneroid pressure h: 1850 Rack travel in mm: 5.50...5.70
Rack travel in mm: 2.50
Speed rpm: 550...650 Speed rpm : 1600 Del.quantity cm3/ : 50.0...51.5 1000 s: (49.0...52.5) Speed : 1000 rpm Spread cm3 : 2.50 Maximum rack trave: 1.80 1000 s: (3.0) Aneroid pressure h: 1850 LOW IDLE 2 rpm : 2200 Del.quantity cm3/: 48.5...50.5 1000 s: (47.5...51.5) Control lever position degrees: 8-12FD 270 Setting point w/out bumper spring cm3 : 2.50 Spread rpm 1000 s: (3.00) Rack travel in mm: 5,6 Aneroid pressure h: 1050 Speed rpm : 1000 Del.quantity cm3/: 34.0...35.0 Testing: Speed : 220 1000 s: (33.0...36.0) rpm Rack travel in mm : 8,0 \*\* cm3 : 2.50 Spread : 345 Speed 1000 s: (3.00) **CDIII** Rack travel in mm: 5,5...5,7 : 580 man Rack travel in mm: 2,5 STARTING FUEL DELIVERY : 680 Speed rpm Rack travel in mm: 2,5 : 100 Speed rpm Del.quantity cm3/: 54.0...0.0 SET IDLE AUXILIARY SPRING rpm : 400 Speed 1000 s: (54.0...0.0) Rack travel in mm : 4,2-4,4FD270 Rack travel in mm : 20.10...0.00 : 4,7-4,9 FD 270 HIGH IDLE TORQUE CONTROL Torque control curve - 1st version 1st version rpm : 1000 1st speed Aneroid pressure h: 1850 Rack travel in m: 13.70...13.80 rpm : 2500 Speed rpm : 1600 2nd speed Rack travel in mm : 8.50...8.90 Rack travel in m: 13.00...13.20 3rd speed rpm : 2200 Del.quantity cm3/: 30.0...34.0 1000 s: (29.0...35.0) Rack travel in m: 12.20...12.40 cm3 : 2.50Spread 1000 s: (3.00) Aneroid/Altitude Compensator Test LOW IDLE Speed rpm : 345 Rack travel in mm : 5.50...5.70 1st version Setting Del.quantity cm3/: 6.0...7.0 1000 s: (5.0...9.5) Speed : 1000 rpm Pressure hPa : 1600 Spread cm3 : 1.00 : 0.30...0.70 Rack travel mm 1000 s: (1.50) Measurement SETTING/TESTING ELECTRONIC IDLE Speed 1/min: 1000 REGULATION (ELR) 1st pressure hPa : 1050

Control lever at idle stop Speed rpm : 370

Rack travel in mm : (10,0...11,4)

Del.quantity cm3/:-

1000 s: (29,0...37,0)

Current A

: 1,8

Control lever at full-load stop Speed rpm : 2950 Rack travel in mm : 0,0...1,0

Current

short-duration A: 3,0

Starting test

Speed rpm : 100 Del.quantity cm3/ : -

min.

1000 s: 54,0 1,8A

Remarks:

ADJUSTMENT OF ACTIVE BUCKING DAMPING (ARD) + starting cam) up to 1000 1/min Control lever on full-load stop. At n = 1000 min -Control-lever position 42.0°, I = 2.5 A, difference in delivery referenced to control-rod travel deduction delivery (5.6...7.6) ccm/1000 strokes. + greater than 0.2 mm after swi

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 16.8°...17.2° (16.7...17.3°) angular displacement of cam following start of delivery of cylinder no. 1.

Difference in start of delivery between max. and min. value = max. 1° angular displacement of cam

CORRECTION OF INJECTED-FUEL QUANTITY
-Set max. change plus/minus 0.75 mm
control-rod travel at correction
screw on ALDA pressure box.

Sliding sleeve pre-travel = 6.25 mm

Testing and adjusting the control-rodtravel sensor with evaluation circuit KDEP-P400 Receiving inspection Shift control lever to full-load stop. Set 13.5 V at stabilizer. Apply 1850 hPa to ALDA. Run up to speed of 1000 1/min; a voltage of 2.457...2.517 (2.427...2.547) V must be displayed on the digital voltmeter. Adjustment of the control-rod travel sensor

At a speed of 1000 1/min, set fuel delivery at 21,5...22,5 (20,5...23,5) ccm/1000 strokes with control lever. Shift control-rod-travel sensor until U = 1,633...1.639 (1.635...1.637) V is indicated. Tighten fastening screws with 1...2 Nm. Control lever to full-load stop; voltage value of 2.457... 2.517 V must be attained.

\* Sliding sleeve pre-travel = 4.7 mm

CHECKING THE IDLE—SPEED AUXILIARY SPRING CUTOFF

-Control—lever position 44,5° max.

D.2 mm control—rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.

-Control—lever position 42,0°, control—rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

TESTING PNEUMATIC SHUTOFF DEVICE -Control lever at idle stop. With n=315 1/min. and pu = 450 mbar, control rod must move quickly to control-rod travel = 0 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB

Edition : 28.10.92

Replaces

Test oil : ISO-4113

Combination no. : 0 400 075 935

Injection pump

Pump designation : PES5M55C32ORS158-1

EP type number : 0 410 055 979

Governor

Governor design. : RSF340/2300M65-4

: 0 420 021 144 Governer no.

T4 Cust. part no.

Customer-spec. information

Customer : MB-PKW

Engine : OM6O2A-ECE

92.0 1st version kW

TEST BENCH REQUIREMENTS

Test oil

inlet temp. \*C : 38...42

Overflow valve

: 1 469 990 351

Inlet press., bar: 1.00

Test nozzle holder

assembly : 0 681 343 009

Opening

pressure, bar : 172...175

Test Lines : 1 680 750 014

Outside diameter

x Wall thickness

: 6.00x2.00x6tx0 x Length mm

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values \_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.20...2.30

: (2.15...2.35)

Rack travel in mm : 20.00...22.00

Firing order : 1-2-4-5-3

Phasina : 0-72-144-216-288

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1000

Rack travel in mm : 13.90...14.00

Del.quantity cm3/ : 5.1...5.2

100 s: (5.0...5.3)

Spread cm3 : 0.2

100 s: (0.3)

rpm : 315.0 2nd speed

Rack travel in mm : 5.3...5.5 Del.quantity cm3/: 0.5...0.6

100 s: (0.4...0.9)

Spread cm3 : 0.1

100 s: (0.1)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000 Aneroid pressure h: 1850

Del.quantity : 51.0...52.0

1000 : (50.0...53.0) : 2.50 cm3 Spread

1000 : (3.00)

RATED SPEED

1st version

Control Lever

position degrees: 50...0

3rd rack travel in: 8,1...8,5

: 2500 Speed rpm

4th rack travel in: 2950

Speed : 0.00...1.00 rpm

SET IDLE CONTROL LEVER

**POSITION** 

: 1000 rpm

Rack travel in mm: 1,7...1,8

LOW IDLE 1

Control lever

position degrees: 812 Setting point w/out bumper spring Speed rpm : 315 Rack travel in mm : 5.4  Testing: Speed rpm : 220 Minimum rack trave: 8.00 Speed rpm : 315 Rack travel in mm : 5.305.50	Del.quantity cm3/: 48.550.5 1000 s: (47.551.5) Spread cm3 : 2.50 1000 s: (3.00) Aneroid pressure h: 1050 Speed rpm : 1000 Del.quantity cm3/: 33.934.0 1000 s: (32.035.0) Spread cm3 : 2.50 1000 s: (3.00)
Rack travel in mm : 2.50 Speed rpm : 540640 Speed rpm : 1000 Maximum rack trave: 1.80	STARTING FUEL DELIVERY
SET IDLE AUXILIARY SPRING Speed rpm : 380 Rack travel in mm : 4,24,4 : (4,14,5)	Speed rpm : 100  Del.quantity cm3/ : 52.00.0  1000 s: (52.00.0)  Rack travel in mm : 20.100.00
TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1000 Rack travel in m: 13.9014.00 2nd speed rpm : 1600 Rack travel in m: 13.1013.30 3rd speed rpm : 2200 Rack travel in m: 12.3012.50 Aneroid/Altitude	#IGH IDLE  1st version Aneroid pressure h: 1850 Speed rpm : 2500 Rack travel in mm : 8.108.50 Del.quantity cm3/: 29.033.0 1000 s: (28.034.0) Spread cm3 : 2.50 1000 s: (3.00)
Compensator Test	LOW IDLE
1st version Setting Speed rpm : 1000 Pressure hPa : 1600 Rack travel mm : 0.500.90	Speed rpm: 315 Rack travel in mm: 5.305.50 Del.quantity cm3/: 5.56.5 1000 s: (4.59.0) Spread cm3: 1.00 1000 s: (1.50)
Measurement Speed 1/min : 1000	SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)
1st pressure hPa : 1050 Rack travel in m: 3.904.20 2nd pressure hPa : 750 Rack travel in m: 5.706.10 FUEL DELIVERY CHARACTERISTICS	Control lever at idle stop Speed rpm : 340 Rack travel in mm : (12,614,0) Del.quantity cm3/: - 1000 s: (41,049,0)
1st version Aneroid pressure h: 1850 Speed rpm : 1600 Del.quantity cm3/ : 50.051.5	Current A : 1,8  Control lever at full-load stop Speed rpm : 2950 Rack travel in mm : 0,01,0 Current short-duration A : 3,0 Starting test Speed rpm : 100 Del.quantity cm3/:- min. 1000 s: 52,0 1,8A

Remarks:

Sliding sleeve pre-travel = 6.5 mm

CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF
-Control-lever position 35,5°, max.
0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.
-Control-lever position 33.0°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

TESTING PNEUMATIC SHUTOFF DEVICE
—Control lever at idle stop.
With n = 315 1/min. and pu = 450 mbar,
control rod must move quickly to
control—rod travel = 0 mm

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 19.3°...19.7° (19.2...19.8°) angular displacement of cam following start of delivery of cylinder no. 1. Difference in start of delivery between max. and min. value = max. 1° angular displacement of cam

Pin projection = 16.60...16.70 mm

CORRECTION OF INJECTED-FUEL GUANTITY
-Set max. change plus/minus 0.75 mm
control-rod travel at correction
screw on ALDA pressure box.

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet Edition : 01.09.92 Replaces Test oil : ISO-4113 Combination no. : 0 400 075 935 Injection pump Pump designation : PES5M55C32ORS158-1 EP type number : 0 410 055 979 Governor Governor design.: RSF340/2300M65-4 : 0 420 021 144 Governer no. Cust. part no. : T8 Customer-spec. information Customer : MB-PKW Engine : OM602A-ECE ALDA 1st version kW : 92.0 TEST BENCH REQUIREMENTS

Test oil inlet temp. °C

: 38...42

Overflow valve

: 1 469 990 351

Inlet press., bar: 1.00

Test nozzle holder

assembly : 0 681 901 111

Opening

pressure, bar : 144...150

Test Lines : 1 680 750 014

Outside diameter x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY Test pressure, bar: 30...32

: 2.20...2.30 Prestroke mm : (2.15...2.35) Rack travel in mm : 20.00...22.00 Firing order : 1-2-4-5-3

Phasina : 0-72-144-216-288

Tolerance  $+ - \cdot : 0.00 (1.00)$ 

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1000

Rack travel in mm : 13.90...14.00

Del.quantity cm3/: 5.2...5.3

100 s: (5.1...5.4)

Spread cm3 : 0.2

100 s: (0.3)

2nd speed rpm : 315.0 Rack travel in mm : 5.3...5.5 Del.guantity cm3/: 0.6...0.7

100 s: (0.5...1.0)

cm3 : 0.1Spread 100 s: (0.1)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000 Aneroid pressure h: 1850

: 52.5...53.5 Del.quantity 1000 : (51.5...54.5)

Spread cm3 : 2.50 1000 : (3.00)

RATED SPEED

1st version Control lever

position degrees: 50...0 3rd rack travel in: 8,1...8,5

Speed rpm : 2500 4th rack travel in: 2950

: 0.00...1.00 Speed mom

SET IDLE CONTROL LEVER POSITION

: 1000 rpm Rack travel in mm: 1,7...1,8

LOW IDLE 1 Control Lever

position degrees: 812 Setting point w/out bumper spring Speed rpm : 315 Rack travel in mm : 5.4  Testing: Speed rpm : 220 Minimum rack trave: 8.00	Del.quantity cm3/: 51.052.5 1000 s: (50.053.5) Spread cm3 : 2.50 1000 s: (3.00) Aneroid pressure h: 1050 Speed rpm : 1000 Del.quantity cm3/: 34.035.0 1000 s: (33.036.0)
Speed rpm : 315 Rack travel in mm : 5.305.50 Rack travel in mm : 2.50 Speed rpm : 540640 Speed rpm : 1000 Maximum rack trave: 1.80	Spread cm3 : 2.50 1000 s: (3.00) STARTING FUEL DELIVERY
SET IDLE AUXILIARY SPRING Speed rpm : 380 Rack travel in mm : 4,204,40 : (4,104,50)	Speed rpm : 100 Del.quantity cm3/: 53.00.0 1000 s: (53.00.0) Rack travel in mm : 20.100.00
TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1000 Rack travel in m: 13.9014.00 2nd speed rpm : 1600 Rack travel in m: 13.1013.30 3rd speed rpm : 2200 Rack travel in m: 12.3012.50 Aneroid/Altitude	HIGH IDLE  1st version Aneroid pressure h: 1850 Speed rpm : 2500 Rack travel in mm : 8.108.50 Del.quantity cm3/: 29.033.0 1000 s: (28.034.0) Spread cm3 : 2.50 1000 s: (3.00)
Compensator Test	LOW IDLE
1st version Setting Speed rpm : 1000 Pressure hPa : 1600 Rack travel mm : 0.500.90	Speed rpm: 315 Rack travel in mm: 5.305.50 Del.quantity cm3/: 6.57.5 1000 s: (5.510.0) Spread cm3: 1.00 1000 s: (1.50)
Measurement Speed 1/min: 1000	+ SETTING/TESTING ELECTRONIC IDLE + REGULATION (ELR)
1st pressure hPa : 1050 Rack travel in m: 3.904.20 2nd pressure hPa : 750 Rack travel in m: 5.706.10  FUEL DELIVERY CHARACTERISTICS  1st version	Control lever at idle stop Speed rpm : 340 Rack travel in mm : (12,614,0 Del.quantity cm3/:- 1000 s: (42,050,0) Current A : 1,8
Aneroid pressure h: 1850 Speed rpm : 1600 Del.quantity cm3/: 52.553.5	Control lever at full-load stop Speed rpm : 2950 Rack travel in mm : 0,01,0 Current short-duration A : 3,0 Starting test Speed rpm : 100 Del.quantity cm3/:- min. 1000 s: 53,0 1,8A

Sliding sleeve pre-travel = 6.5 mm

CHECKING THE IDLE—SPEED AUXILIARY SPRING CUTOFF
-Control-lever position 35,5°, max.
0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.
-Control-lever position 33.0°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

TESTING PNEUMATIC SHUTOFF DEVICE
-Control lever at idle stop.
With n = 315 1/min. and pu = 450 mbar,
control rod must move quickly to
control-rod travel = 0 mm

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 19.3°...19.7° (19.2...19.8°) angular displacement of cam following start of delivery of cylinder no. 1. Difference in start of delivery between max. and min. value = max. 1° angular displacement of cam

Pin projection = 16.60...16.70 mm

CORRECTION OF INJECTED-FUEL QUANTITY -Set max. change plus/minus 0.75 mm control-rod travel at correction screw on ALDA pressure box.

Note remarks

: MB 2,5 c7 : 27.10.92 : 08.10.91 Test sheet Edition Replaces

Test oil : ISO-4113

Combination no. : 0 400 075 936

Injection pump

Pump designation : PES5M55C32ORS158 EP type number : 0 410 055 986

Governor

Governor design. : RSF340/2300M64-14 : 0 420 021 142 Governer no.

Cust. part no. : T4

Customer-spec. information Customer : MB-PKW

Engine : OM602A-Abgast.

1st version kW : 92.0

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 469 990 351

Inlet press., bar: 1.00

Test nozzle holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.20...2.30

: (2.15...2.35)

Rack travel in mm : 20.00...22.00

Firing order : 1-2-4-5-3

Phasina : 0-72-144-216-288

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

rpm: 1000 1st speed

Rack travel in mm : 13.90...14.00

Del.quantity cm3/: 5.1...5.2

100 s: (5.0...5.3)

Spread cm3 : 0.2

100 s: (0.3)

rom : 315.02nd speed

Rack travel in mm: 5.3...5.5 Del.quantity cm3/: 0.55...0.65

100 s: (0.45...0.9)

cm3 : 0.1 Spread

100 s: (0.15)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000 Aneroid pressure h: 1850

: 51.0...52.0 Del.quantity

1006 : (50.0...53.0)

Spread

cm3 : 2.50 1000 : (3.00)

RATED SPEED

1st version

Control lever

position degrees: 50...0 3rd rack travel in: 8.1...8.5

rpm : 2500 Speed

4th rack travel in: 2950

Speed rpm : 0.00...1.00

SET IDLE CONTROL LEVER

POSITION

: 1000 Speed rpm

Rack travel in mm: 1,7...1,8

LOW IDLE 1

Control lever

position degrees: 812 Setting point w/out bumper spring Speed rpm : 315 Rack travel in mm : 5.4  Testing: Speed rpm : 220 Minimum rack trave: 8.00 Speed rpm : 315 Rack travel in mm : 5.305.50 Rack travel in mm : 2.50	Del.quantity cm3/: 48.550.5 1000 s: (47.551.5) Spread cm3 : 2.50 1000 s: (3.00) Aneroid pressure h: 1050 Speed rpm : 1000 Del.quantity cm3/: 33.034.0 1000 s: (32.035.0) Spread cm3 : 2.50 1000 s: (3.00)
Spæed rpm : 540640 Spæed rpm : 1000 Maximum rack trave: 1.80	STARTING FUEL DELIVERY
SET IDLE AUXILIARY SPRING Speed rpm : 390 Rack travel in mm : 4,24,4 : (4,14,5)	Speed rpm : 100 Del.quantity cm3/: 52.00.0 1000 s: (52.00.0) Rack travel in mm : 20.100.00
TORQUE CONTROL  Torque control curve - 1st version  1st speed rpm : 1000  Rack travel in m: 13.9014.00  2nd speed rpm : 1600  Rack travel in m: 13.1013.30  3rd speed rpm : 2200  Rack travel in m: 12.3012.50  Ameroid/Altitude	HIGH IDLE  1st version Aneroid pressure h: 1850 Speed rpm : 2500 Rack travel in mm : 8.108.50 Del.quantity cm3/: 29.033.0 1000 s: (28.034.0) Spread cm3 : 2.50 1000 s: (3.00)
Compensator Test	+ LOW IDLE
1st version Setting Speed rom : 1000 Pressure hPa : 1600 Rack travel mm : 0.500.90	Speed rpm : 315 - Rack travel in mm : 5.305.50 - Del.quantity cm3/ : 5.56.5 - 1000 s: (4.59.0) - Spread cm3 : 1.00 - 1000 s: (1.50)
Measurement Speed 1/min : 1000	+ SETTING/TESTING ELECTRONIC IDLE + REGULATION (ELR)
1st pressure hPa : 1050 Rack travel in m: 3.904.20 2nd pressure hPa : 750 Rack travel in m: 5.706.10  FUEL DELIVERY CHARACTERISTICS  1st version	Control lever at idle stop  Speed rpm : 340  Rack travel in mm : (12,614,0)  Del.quantity cm3/: -  1000 s: (41,049,0)  Current A : 1,8
Aneroid pressure h: 1850 Speed rpm : 1600 Del.quantity cm3/ : 50.051.5	Control lever at full-load stop Speed rpm : 2950 Rack travel in mm : 0.01.0 Current short-duration A : 3.0 Starting test Speed rpm : 100 Del.quantity cm3/:- min. 1000 s: 52,0 1,8A

Sliding sleeve pre-travel = 6.5 mm

TESTING PNEUMATIC SHUTOFF DEVICE
-Control lever at idle stop.
With n = 315 1/min. and pu = 450 mbar,
control rod must move quickly to
control-rod travel = 0 mm

Start-of-delivery sensor system; adjustment and blocking with device KDEP 1077 = 19.3°...19.7° (19.2...19.8°) angular displacement of cam following start of delivery of cylinder no. 1. Difference in start of delivery between max. and min. value = max. 1° angular displacement of cam

Pin projection = 16.60...16.70 mm

CORRECTION OF INJECTED-FUEL QUANTITY
-Set max. change plus/minus 0.75 mm
control-rod travel at correction
screw on ALDA pressure box.

Testing and adjusting the control-rod-travel sensor with evaluation circuit KDEP-P400
Receiving inspection
Shift control lever to full-load stop. Set 13.5 V at stabilizer. Apply 1850 hPa to ALDA. Run up to speed of 1000 1/min; a voltage of 2.472...2.532 (2.442...2.562) V must be displayed on the digital voltmeter.

Adjustment of the control-rod travel sensor

At a speed of 1000 1/min, set fuel delivery at 23.0...24.0 (22.0...25.0) ccm/1000 strokes with control lever. Shift control-rod-travel sensor until U = 1.633...1.639 (1.635...1.637) V is indicated. Tighten fastening screws with 1...2 Nm. Control lever to full-load stop; voltage value of 2.472... 2.532 V must be attained.

CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF
-Control-lever position 35,5°, max.
0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.
-Control-lever position 33.0°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : MB : 27,10,92 Edition Replaces Test oil : ISO-4113 : 0 400 075 936 Combination no. Injection pump EP type number : 0 410 055 986 Governor Governor design. Governer no. : 0 420 021 142 Cust. part no. : T8 Customer-spec, information Customer : MB-PKW Engine : OM602A-Abgast. 1st version kW : 92.0 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 469 990 351 Inlet press., bar: 1.00 Test nozzle holder assembly : 0 688 901 111 Openina : 144...150 pressure, bar Test lines : 1 680 750 014 Outside diameter x Wall thickness : 6.00x2.00x600 x Length mm (A) Injection pump setting values Insp. values in parentheses

Pump designation : PES5M55C320RS158 : RSF340/2300M64-14 Set equal delivery quant. per values BEGINNING OF DELIVERY Test pressure, bar: 30...32 : 2.20...2.30 Prestroke mm : (2.15...2.35)

Rack travel in mm : 20.00...22.00 : 1- 2- 4- 5- 3 Firing order Phasing : 0-72-144-216-288 Tolerance + - \* : 0.00 (1.00) Time to cyl. no. : 1 BASIC SETTING 1st speed rom: 1000 Rack travel in mm : 13.90...14.00 Del.quantity cm3/: 5.2...5.3 100 s: (5.1...5.4) Spread cm3 : 0.2100 s: (0.3) 2nd speed rpm : 315.0 Rack travel in mm : 5.3...5.5 Del.quantity cm3/: 0.65...0.75 100 s: (0.55...1.0) Spread cm3 : 0.1100 s: (0.15) FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 1000 Aneroid pressure h: 1850 : 52.5...53.5 Del.quantity 1000 : (51.5...54.5) : 2.50 Spread cm3 1000 : (3.00) RATED SPEED 1st version Control lever position degrees: 50...0 3rd rack travel in: 8.1...8.5 Speed rpm : 2500 4th rack travel in: 2950 Speed CDM : 0.00...1.00 SET IDLE CONTROL LEVER **POSITION** : 1000 rpm Rack travel in mm: 1,7...1,8 LOW IDLE 1

Control Lever

position degrees: 812 Setting point w/out bumper spring Speed rpm : 315 Wack travel in mm : 5.4  Testing: Speed rpm : 220 Minimum rack trave: 8.00 Speed rpm : 315 Rack travel in mm : 5.305.50 Rack travel in mm : 2.50	Del.quantity cm3/: 48.550.5 1000 s: (47.551.5) Spread cm3 : 2.50 1000 s: (3.00) Aneroid pressure h: 1050 Speed rpm : 1000 Del.quantity cm3/: 34.035.0 1000 s: (33.036.0) Spread cm3 : 2.50 1000 s: (3.00)
Speed rpm : 540640 Speed rpm : 1000 Maximum rack trave: 1.80	STARTING FUEL DELIVERY
SET IDLE AUXILIARY SPRING Speed rpm : 380 Rack travel in mm : 4,24,4 : (4,14,5)	Speed rpm : 100 Del.quantity cm3/ : 53.00.0 1000 s: (53.00.0) Rack travel in mm : 20.100.00
TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1000 Rack travel in m: 13.9014.00 2nd speed rpm : 1600 Rack travel in m: 13.1013.30 3rd speed rpm : 2200 Rack travel in m: 12.3012.50  Aneroid/Altitude Compensator Test	HIGH IDLE  1st version Aneroid pressure h: 1850 Speed rpm : 2500 Rack travel in mm : 8.108.50 Del.quantity cm3/ : 29.033.0 1000 s: (28.034.0) Spread cm3 : 2.50 1000 s: (3.00)
conpensator rest	LOW IDLE
1st version Setting Speed rpm : 1000 Pressure hPa : 1600 Rack travel mm : 0.500.90	Speed rpm : 315 Rack travel in mm : 5.305.50 Del.quantity cm3/ : 6.57.5 1000 s: (5.510.0) Spread cm3 : 1.00 1000 s: (1.50)
Measurement Speed 1/min: 1000	+ SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)
1st pressure hPa : 1050 Rack travel in m: 3.904.20 2nd pressure hPa : 750 Rack travel in m: 5.706.10 FUEL DELIVERY CHARACTERISTICS	Control lever at idle stop Speed rpm : 340 Rack travel in mm : (12,614,0) Del.quantity cm3/: - 1000 s: (42,050,0)
1st version Ameroid pressure h: 1850 Speed rpm : 1600 Del.quantity cm3/ : 51.052.5	Current A : 1,8  Control lever at full-load stop Speed rpm : 2950 Rack travel in mm : 0.01.0 Current short-duration A : 3.0 Starting test Speed rpm : 100 Del.quantity cm3/: - min. 1000 s: 53,0 1,8A

Sliding sleeve pre-travel = 6.5 mm

TESTING PNEUMATIC SHUTOFF DEVICE -Control lever at idle stop. With n = 315 1/min. and pu = 450 mbar, control rod must move quickly to control-rod travel = 0 mm

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 19.3°...19.7° (19.2...19.8°) angular displacement of cam following start of delivery of cylinder no. 1. Difference in start of delivery between max. and min. value = max. 1° angular displacement of cam

Pin projection = 16.60...16.70 mm

CORRECTION OF INJECTED—FUEL QUANTITY—Set max. change plus/minus 0.75 mm control—rod travel at correction screw on ALDA pressure box.

Testing and adjusting the control-rod-travel sensor with evaluation circuit KDEP-P4:00
Receiving inspection
Shift control lever to full-load stop.
Set 13.5 V at stabilizer. Apply 1850 hPa to ALDA. Run up to speed of 1000 1/min; a voltage of 2.472...2.532 (2.442...2.562) V must be displayed on the digital voltmeter.

CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF
-Control-lever position 35,5°, max.
0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.
-Control-lever position 33.0°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks : MB 2,5 C2 Test sheet Edition : 28.10.92 Replaces : 14.10.91 Test oil : ISO-4113 Combination no. : 0 400 075 937 Injection pump Pump designation : PES5M55C32ORS158 EP type number : 0 410 055 986 Governor Governor design. : RSF340/2300M74 : 0 420 021 140 Governer no. Cust. part no. : T4 Customer-spec. information Custamer : MB-PKW Engine : OM6O2A-Abgast. 1st version kW : 92.0 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 469 990 351 Inlet press., bar: 1.00 Test nozzle holder : 0 681 343 009 assembly Opening pressure, bar : 172...175 Test lines : 1 680 750 014 Outside diameter x Wall thickness : 6.00x2.00x600 x Length mm (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values \_\_\_\_

BEGINNING OF DELIVERY Test pressure, bar: 30...32 Prestroke mm : 2.20...2.30 : (2.15...2.35) Rack travel in mm : 20.00...22.00 Firing order : 1-2-4-5-3 Phasing : 0-72-144-216-288 Tolerance + - ° : 0.00 (1.00) Time to cyl. no. : 1 BASIC SETTING 1st speed rpm: 1000 Rack travel in mm : 13.90...14.00 Del.quantity cm3/ : 5.1...5.2 100 s: (5.0...5.3) Spread cm3 : D.2 100 s: (0.3) 2nd speed rpm : 345.0 Rack travel in mm : 5.3...5.5 Del.quantity cm3/: 0.5...0.6 100 s: (0.4...0.85) Spread cm3 : 0.1100 s: (0.15) FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 1000

Aneroid pressure h: 1850 Del.quantity : 51.0...52.0

1000 : (50.0...53.0) : 2.50 cm3

1000 : (3.00)

RATED SPEED

Spread

1st version Control lever

position degrees: 50...0 3rd rack travel in: 8.1...8.5

Speed rpm : 2500 4th rack travel in: 2950

rpm : 0.00...1.00Speed

SET IDLE CONTROL LEVER POSITION

rpm : 1000 Rack travel in mm: 1.7...1.8

LOW IDLE 1 Control lever

position degrees: 812 Setting point w/out bumper spring Speed rpm : 345 Rack travel in mm : 5.4  Testing: Speed rpm : 150 Minimum rack trave: 10.0+1 Speed rpm : 345 Rack travel in mm : 5.305.50 Rack travel in mm : 2.50	Del.quantity cm3/: 48.550.5  1000 s: (47.551.5)  Spread cm3 : 2.50  1000 s: (3.00)  Aneroid pressure h: 1050  Speed rpm : 1000  Del.quantity cm3/: 33.034.0  1000 s: (32.035.0)  Spread cm3 : 2.50  1000 s: (3.00)
Speed rpm : 540640 Speed rpm : 1000 Maximum rack trave: 1.80	STARTING FUEL DELIVERY
SET IDLE AUXILIARY SPRING Speed rpm : 380 Rack travel in mm : 4.24.4 : (4.14.5)	Speed rpm : 100  Del.quantity cm3/ : 52.00.0  1000 s: (52.00.0)  Rack travel in mm : 20.100.00
TORQUE CONTROL  Torque control curve - 1st version  1st speed rpm : 1000  Rack travel in m: 13.9014.00  2nd speed rpm : 1600  Rack travel in m: 13.1013.30  3rd speed rpm : 2200  Rack travel in m: 12.3012.50  Aneroid/Altitude	HIGH IDLE  1st version Aneroid pressure h: 1850 Speed rpm : 2500 Rack travel in mm : 8.108.50 Del.quantity cm3/: 29.033.0 1000 s: (28.034.0) Spread cm3 : 2.50 1000 s: (3.00)
Compensator Test	LOW IDLE
1st version Setting Speed rpm : 1000 Pressure hPa : 1600 Rack travel mm : 0.500.90	Speed rpm : 345 Rack travel in mm : 5.305.50 Del.quantity cm3/ : 5.06.0 1000 s: (4.08.5) Spread cm3 : 1.00 1000 s: (1.50)
Measurement Speed 1/min: 1000	SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)
1st pressure hPa : 1050 Rack travel in m: 3.904.20 2nd pressure hPa : 750 Rack travel in m: 5.706.10 FUEL DELIVERY CHARACTERISTICS	Control lever at idle stop Speed rpm : 370 Rack travel in mm : (10.011.4) Del.quantity cm3/: -
1st version Aneroid pressure h: 1850 Speed rpm : 1600 Del.quantity cm3/: 50.051.5 1000 s: (49.052.5) Spread cm3 : 2.50 1000 s: (3.5) Aneroid pressure h: 1850 Speed rpm : 2200	1000 s: (31,539,5)  Current A : 1.8  Control lever at full-load stop Speed rpm : 2950 Rack travel in mm : 0.01.0 Current short-duration A : 3,0 Starting test Speed rpm : 100 Del.quantity cm3/:- min. 1000 s: 52.0 1.8A

\* Sliding sleeve pre-travel = 4.7 mm

CHECKING THE PNEUMATIC SHUTOFF BOX
-Control lever up against idle stop.
At n = 345 1/min and pu = 450 mbar
control rod must move briskly to
control-rod travel = 0 mm

CHECKING THE IDLE—SPEED AUXILIARY SPRING CUTOFF
—Control—lever position 35,5°, max.
0.2 mm control—rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.
—Control—lever position 33.0°, control—rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

ADJUSTMENT OF ACTIVE BUCKING DAMPING (ARD)
Control lever on full-load stop. At n = 1000 min. -1,
I = 2.5 A, difference in delivery referenced to full-load delivery (4.4...6.4) ccm/1000 strokes.

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 19.3°...19.7° (19.2...19.8°) angular displacement of cam following start of delivery of cylinder no. 1. Pin projection = 16.60...16.70 mm

CORRECTION OF INJECTED-FUEL QUANTITY -Set max. change plus/minus 0.75 mm control-rod travel at correction screw on ALDA pressure box.

BOSCH INU. PUMP TEST SPECIFICATIONS Rack travel in mm : 20.00...22.00 Firing order : 1-2-4-5-3 Note remarks Test sheet Edition : 28.10.92 Phasina : 0-72-144-216-288 Replaces Test oil : ISO-4113 Tolerance + - \* : 0.00 (1.00) Combination no. : 0 400 075 937 Time to cyl. no. : 1 Injection pump BASIC SETTING Pump designation : PES5M55C32ORS158 EP type number : 0 410 055 986 1st speed rpm : 1000Governor Covernor design. : RSF340/23C0M74 Rack travel in mm : 13.90...14.00 : 0 420 021 140 Governer no. Del.quantity cm3/: 5.2...5.3 Cust. part no. : 178 100 s: (5.1...5.4) Customer-spec. information Customer : MB-PKW Spread cm3 : 0.2Engine : OM602A-Abgast. 100 s: (0.3) 2nd speed rpm : 345.0 Rack travel in mm : 5.3...5.5 Del.quantity cm3/ : 0.6...0.7 1st version kW : 92.0 TEST BENCH REQUIREMENTS 100 s: (0.5...0.9) Test oil Spread cm3 : 0.1inlet temp. \*C : 38...42 100 s: (0.1) Overflow valve FULL LOAD DELIV. AT FULL LOAD STOP : 1 469 990 351 1st version Inlet press., bar: 1.00 Speed rpm : 1000 Aneroid pressure h: 1850 Test nozzle holder Del.quantity : 52.5...53.5 1000 : (51.5...54.5) : 0 688 901 111 assembly : 2.50 Spread cm3 **Openina** 1000 : (3.00)pressure, bar : 147...150 RATED SPEED Test lines : 1 680 750 014 1st version Control lever Outside diameter position degrees: 50...0 x Wall thickness 3rd rack travel in: 8,1...8,5 x Length mm : 6.00x2.00x600 : 2500 Speed rom 4th rack travel in: 2950 (A) Injection pump setting values : 0.00...1.00 Speed rpm Insp. values in parentheses Set equal delivery quant. SET IDLE CONTROL LEVER per values \_\_\_\_ **POSITION** BEGINNING OF DELIVERY Speed man Test pressure, bar: 30...32 Rack travel in mm: 1,7...1,8 Prestroke mm : 2.20...2.30 LOW IDLE 1

Control lever

: (2.15...2.35)

position degrees: 812 FD<270 Setting point w/out bumper spring Speed rpm : 345 Rack travel in mm : 5.4	Rack travel in m: 3.904.20 2nd pressure hPa : 750 Rack travel in m: 5.706.10
	FUEL DELIVERY CHARACTERISTICS
Testing: Speed rpm : 150 * Minimum rack trave: 10,0+1 Speed rpm : 345 Rack travel in mm : 5.305.50 Rack travel in mm : 2.50 Speed rpm : 540640 Speed rpm : 1000 Maximum rack trave: 1.80	1st version Aneroid pressure h: 1850 Speed rpm : 1600 Del.quantity cm3/: 51.052.5 1000 s: (50.053.5) Spread cm3 : 2.50 1000 s: (3.0)
LOW IDLE 2 Control lever position degrees: 8-12FD 270 Setting point w/out bumper spring Speed rpm : 345 Rack travel in mm : 5.35.5 Testing:	Aneroid pressure h: 1850  Speed rpm : 2200  Del.quantity cm3/: 48.550.5  1000 s: (47.551.5)  Spread cm3 : 2.50  1000 s: (3.00)  Aneroid pressure h: 1050  Speed rpm : 1000
Speed rpm: 220 Rack travel in mm: 8,0** Speed rpm: 345 Rack travel in mm: 5,35,5 Speed rpm: 540	Del.quantity cm3/: 34.035.0 1000 s: (33.036.0) Spread cm3 : 2.50 1000 s: (3.00)
Rack travel in mm : 2,5 Speed rpm : 640 Rack travel in mm : 2,5	STARTING FUEL DELIVERY
SET IDLE AUXILIARY SPRING Speed rpm : 380 Rack travel in mm : 4.24,4 : (4,14,5)	Speed rpm : 100 - Del.quantity cm3/: 53.00.0 1000 s: (53.00.0) - Rack travel in mm : 20.100.00
TORQUE CONTROL  Torque control curve - 1st version  1st speed rpm : 1000  Rack travel in m: 13.9014.00  2nd speed rpm : 1600  Rack travel in m: 13.1013.30  3rd speed rpm : 2200  Rack travel in m: 12.3012.50  Aneroid/Altitude	HIGH IDLE   1st version   Aneroid pressure h: 1850   Speed   rpm : 2500   Rack travel in mm : 8.108.50   Del.quantity cm3/: 29.033.0   1000 s: (28.034.0)   Spread   cm3 : 2.50   1000 s: (3.00)
Compensator Test	T LOW IDLE
1st version Setting Speed rom : 1000 Pressure hPa : 1600 Rack travel mm : 0.500.90	Speed rpm: 345 Rack travel in mm: 5.305.50 Del.quantity cm3/: 6.07.0 1000 s: (5.09.5) Spread cm3: 1.00 1000 s: (1.50)
	1
Measurement Speed 1/min : 1000	SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

Control lever at idle stop Speed rpm : 370 Rack travel in mm : (10,0...11,4) Del.quantity cm3/: -1000 s: (32,5...40,5) Current A : 1,8 Control lever at full-load stop rpm : 2950 Rack travel in mm: 0,0...1,0 Current short-duration A: 3,0 Starting test speed rpm : 100 Del.quantity cm3/:min. 1000 s: 53,0 1,8A Remarks: Sliding sleeve pre-travel = 6.25 mm \* Sliding sleeve pre-travel = 4.7 mm CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF -Control-lever position 44,5° max. 0.2 mm control-rod travel deduction ad allowable after switchover point (of starting cam) up to 1000 1/miri. -Control-lever position 42,0°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam). CHECKING THE PNEUMATIC SHUTOFF BOX -Control lever up against idle stop. At n = 345 1/min and pu = 450 mbar control rod must move briskly to control-rod travel = 0 mm Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 19.3°...19.7° (19.2...19.8°) angular displacement of cam following start of delivery of cylinder no. 1. Difference in start of delivery between max. and min. value = max. 1° angular displacement of cam CORRECTION OF INJECTED-FUEL QUANTITY -Set max. change plus/minus 0.75 mm control-rod travel at correction screw on ALDA pressure box.

Testing and adjusting the control-rod-

travel sensor with evaluation circuit KDEP-P400
Receiving inspection
Shift control lever to full-load stop.
Set 13.5 V at stabilizer. Apply
1850 hPa to ALDA. Run up to speed of 1000 1/min; a voltage of 2.472...2.532 (2.442...2.562) V must be displayed on the digital voltmeter.

ADJUSTMENT OF ACTIVE BUCKING DAMPING (ARD) Control lever on full-load stop. At  $n=1000\,\mathrm{m}$  I = 2.5 A, difference in delivery referenced to

delivery (5.6...7.6) ccm/1000 strokes.

Note remarks

: MB 2,5 c10 : 28.10.92 Test sheet Edition Replaces : 14.10.91

Test oil : ISO-4113

Combination no. : 0 400 075 944

Injection pump

Pump designation : PES5M55c320RS177 EP type number : 0 410 055 974

Governor

Governor design. : RSF340/2300M64-12

Governer no. : 0 420 021 127

Cust. part no. : T4

Customer-spec. information Customer : MB-PKW

Engine : DM602A-USA MJ90

1st version kW : 92.0

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 469 990 351

Inlet press., bar: 1.00

Test nozzle holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

Test Lines : 1 680 750 014

Outside diameter x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 1.70...1.80 Prestroke mm

: (1.65...1.85)

Rack travel in mm : 20.00...22.00

Firing order : 1-2-4-5-3

Phasina : 0-72-144-216-288

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed rom: 1000

Rack travel in mm : 13.70...13.80

Del.guantity cm3/: 5.1...5.2

100 s: (5.0...5.3)

Spread cm3 : 0.2

100 s: (0.3)

2nd speed rpm : 315.0 Rack travel in mm: 5.6...5.8

Del.quantity cm3/: 0.5...0.6

100 s: (0.4...0.85)

Spread cm3 : 0.1100 s: (0.15)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000 Aneroid pressure h: 1850

Del.quantity : 51.0...53.0) : 2.50 cm3

1000 : (3.00)

RATED SPEED

1st version

Control Lever

position degrees: 50...0 3rd rack travel in: 8.5...8.9

Speed rpm : 2500

4th rack travel in: 2950

: 0.00...1.00 Speed rpm

SET IDLE CONTROL LEVER

**POSITION** 

rom : 1000

Rack travel in mm: 1.7...1.8

LOW IDLE 1

Control lever

position degrees: 812 Setting point w/out bumper spring Speed rpm : 315 Rack travel in mm : 5.7 Testing:	Spread cm3 : 2.50 1000 s: (3.00) Aneroid pressure h: 1050 Speed rpm : 1000 Del.quantity cm3/: 33.034.0 1000 s: (32.035.0)
Speed rpm: 220 Minimum rack trave: 8.00 Speed rpm: 315 Rack travel in mm: 5.605.80 Speed rpm: 1000	Spread cm3 : 2.50 1000 s: (3.00) STARTING FUEL DELIVERY
Maximum rack trave: 1.80  SET IDLE AUXILIARY SPRING	Speed rpm : 100
Speed rpm : 380 Rack travel in mm : 4.74.9 : (4.65.0)	Del.quantity cm3/: 52.00.0 1000 s: (52.00.0) Rack travel in mm: 20.100.00
TORQUE CONTROL Torque control curve - 1st version 1st speed	HIGH IDLE 1st version
Rack travel in m: 13.7013.80  2nd speed rpm : 1600  Rack travel in m: 13.0013.20  3rd speed rpm : 2200  Rack travel in m: 12.2012.40	+ Aneroid pressure h: 1850 + Speed rpm : 2500 + Rack travel in mm : 8.508.90 + Del.quantity cm3/ : 29.033.0 + 1000 s: (28.034.0) + Spread cm3 : 2.50
Aneroid/Altitude Compensator Test	1000 s: (3.00)
1st version Setting Speed rpm : 1000 Pressure hPa : 1600 Rack travel mm : 0.300.70	Speed rpm: 315 Rack travel in mm: 5.605.80 Del.quantity cm3/: 5.06.0 1000 s: (4.08.5) Spread cm3: 1.00 1000 s: (1.50)
Measurement Speed 1/min: 1000	SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)
1st pressure hPa : 1050 Rack travel in m: 3.403.60 2nd pressure hPa : 750 Rack travel in m: 4.905.30  FUEL DELIVERY CHARACTERISTICS  1st version Approid pressure h: 1850	Control lever at idle stop  Speed rpm : 340  Rack travel in mm : (12.614.0)  Del.quantity cm3/: -  1000 s: (41.049.0)  Current A : 1.8
Aneroid pressure h: 1850  Speed rpm : 1600  Del.quantity cm3/ : 49.551.0  1000 s: (48.552.0)  Spread cm3 : 2.50  1000 s: (3.)  Aneroid pressure h: 1850  Speed rpm : 2200  Del.quantity cm3/ : 48.550.5  1000 s: (47.551.5)	Control lever at full-load stop Speed rpm : 2950 Rack travel in mm : 0.01.0 Current short-duration A : 3.0 Starting test Speed rpm : 100 Del.quantity cm3/: - min. 1000 s: 52.0 1,8A
	Remarks:

Sliding sleeve pre-travel = 6.5 mm

CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position 35,5°, max.

0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.

-Control-lever position 33.0°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

TESTING PNEUMATIC SHUTOFF DEVICE
-Control lever at idle stop.
With n = 315 1/min. and pu = 450 mbar,
control rod must move quickly to
control-rod travel = 0 mm

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 16.8°...17.2° (16.7...17.3°) angular displacement of cam following start of delivery of cylinder no. 1.

Pin projection = 16.60...16.70 mm

CORRECTION OF INJECTED-FUEL QUANTITY
-Set max. change plus/minus 0.75 mm
control-rod travel at correction
screw on ALDA pressure box.

Testing and adjusting the control-rod-travel sensor with evaluation circuit KDEP-P400
Receiving inspection
Shift control lever to full-load stop. Set 13.5 V at stabilizer. Apply 1850 hPa to ALDA. Run up to speed of 1000 1/min; a voltage of 2.487...2.547 (2.457...2.577) V must be displayed on the digital voltmeter.

Adjustment of the control-rod travel sensor

At a speed of 1000 1/min, set fuel delivery at 18.5...19.5 17.50...20.5) ccm/1000 strokes with control lever. Shift control-rod-travel sensor until U = 1.633...1.639 (1.635...1.637) V is indicated. Tighten fastening screws

with 1...2 Nm. Control lever to fullload stop; voltage value of 2.487... 2.547 V must be attained.

Note remarks

Test sheet : MB

Edition : 28.10.92

Replaces

Test oil : ISO-4113

Combination no. : 0 400 075 944

Injection pump

Pump designation : PES5M55C32ORS177

EP type number : 0 410 055 974

Governor

Governor design. : RSF340/2300M64-12

: 0 420 021 127 Governer no.

Cust. part no. : T8

Sustomer-spec. information

Customer : MB-PKW

Engine : 0M602A-USA MJ90

1st version kW : 92.0

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 469 990 351

Inlet press., bar: 1.00

Test nozzle holder

assembly : 0 688 901 111

Opening

pressure, bar : 144...150

Test Lines : 1 680 750 014

Outside diameter

x Wall thickness

x Length mm : 6.00X2.00X600

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prostroke mm : 1.70...1.80

: (1.65...1.85)

Rack travel in mm : 20.00...22.00

Firing order : 1-2-4-5-3

Phasing : 0-72-144-216-288

Tolerance  $+ - \circ : 0.00 (1.00)$ 

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1000

Rack travel in mm : 13,70...13.80

Del. quantity cm3/: 5.1...5.2

100 s: (5.0...5.3)

Spread cm3 : 0.2

100 s: (0.3)

2nd speed rpa : 315.0

Rack travel in mm: 5.6...5.8

Del.quantity cm3/: 0.6...0.7 100 s: (0.5...0.9)

Spread cm3 : 0.1

100 s: (0.1)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1350

Del.quantity : 57.7...53.7)

: 2.50 Spread cm3

1000 : (3.00)

RATED SPEED

1st version

Control lever

position degrees: 50...0

3rd rack travel in: 8,5...8,9

Speed rpm : 2500

4th rack travel in: 2950

: 0.00...1.00 Speed rpm

SET IDLE CONTROL LEVER

**POSITION** 

**CDW** 

Rack travel in mm: 1,7...1,8

LOW IDLE 1

Control lever

position degrees: 8...12 Spread cm3 : 2.50Setting point w/out bumper spring 1000 s: (3.00) man : 315 Aneroid pressure h: 1050 Rack travel in mm: 5.7 : 1000 Speed תוכות Del.quantity cm3/: 34.0...35.0 1000 s: (33.0...36.0) Testina: Speed man : 220 Spread cm3 : 2.50Minimum rack trave: 8.00 1000 s: (3.00) Speed rpm : 315 Rack travel in mm : 5.60...5.80 : 1000 Speed rom STARTING FUEL DELIVERY Maximum rack trave: 1.80 SET IDLE AUXILIARY SPRING : 100 Speed rom rpm : 380 Del.quantity cm3/: 54.0 Speed Rack travel in mm: 4,7...4,9 1000 s: : (4,6...5,0) Rack travel in mm: 20.1 TORQUE CONTROL HIGH IDLE Torque control curve - 1st version : 1000 ist speed rpin 1st version Rack travel in m: 13.70...13.80 Aneroid pressure h: 1850 rpm : 1600 Speed rpm : 2500 Rack travel in mm : 8.50...8.90 2nd speed Rack travel in m: 13.00...13.20 3rd speed rom : 2200 Del.quantity cm3/: 30.0...34.0 Rack travel in m: 12.20...12.40 1000 s: (29.0...35.0) cm3 : 2.50 Spread Aneroid/Altitude 1000 s: (3.00) Compensator Test LOW IDLE 1st version rpm : 315 Speed Rack travel in mm : 5.60...5.80 Setting : 1000 Speed rom Del.quantity cm3/: 6.0...7.0 hPa : 1600 Pressure 1000 s: (5.0...9.5) : 0.30...0.70 Rack travel mm cm3 : 1.00Spread 1000 s: (1.50) Measurement  $1/\min : 1000$ Speed SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR) 1st pressure hPa : 1050 Rack travel in m: 3.40...3.60 2nd pressure hPa : 750 Control lever at idle stop Rack travel in m: 4.90...5.30 rpm : 340 Rack travel in mm : (12,6...14,0) FUEL DELIVERY CHARACTERISTICS Del.quantity cm3/: -1000 s: (42,5...50,5) Current A : 1,8 1st version Aneroid pressure h: 1850 Control lever at full-load stop Speed : 1600 : 2950 CDUI rpm Del.quantity cm3/: 50.0...51.5 1000 s: (49.0...52.5) Rack travel in mm: 0,0...1,0 Current Spread cm3 : 2.50 short-duration A: 3,0 1000 s: (3.0) Starting test Aneroid pressure h: 1850 : 100 Speed rpm : 2200 Del.quantity cm3/: nom Del.quantity cm3/: 48.5...50.5 1000 s: 54,0 / 1,8A min. 1000 s: (47.5...51.5)

Remarks:

CORRECTION OF INJECTED-FUEL QUANTITY
-Set max. change plus/minus 0.75 mm
control-rod travel at correction
screw on ALDA pressure box.

Sliding sleeve pre-travel = 6.5 mm

CHECKING THE IDLE—SPEED AUXILIARY SPRING CUTOFF
—Control-lever position 35,5°, max.
0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.
—Control-lever position 33.0°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

TESTING PNEUMATIC SHUTOFF DEVICE
-Control lever at idle stop.
With n = 315 1/min. and pu = 450 mbar,
control rod must move quickly to
control-rod travel = 0 mm

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 16.8°...17.2° (16.7...17.3°) angular displacement of cam following start of delivery of cylinder no. 1.

Difference in start of delivery between max. and min. value = max. 1° angular displacement of cam

Testing and adjusting the control-rodtravel sensor with evaluation circuit KDEP-P400 Receiving inspection Shift control lever to full-load stop. Set 13.5 V at stabilizer. Apply 1850 hPa to ALDA. Run up to speed of 1000 1/min; a voltage of 2.487...2.547 (2.457...2.577) V must be displayed on the digital voltmeter.

Note remarks

Test sheet : MB

: 29.10.92 Edition : 08.07.92 Replaces Test oil : ISO-4113

Combination no. : 0 400 075 959

Injection pump

Pump designation : PES5M55C32ORS166 EP type number : 0 410 055 980

Governor

Governor design: : RSF340/2300M64-1 : 0 420 021 050 Governer no.

Cust. part no. : T4

Customer-spec. information Customer : MB-PKW

: OM602A Engine

1st version kW : 92.0

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 469 990 351

Inlet press., bar: 1.00

Test nozzle holder

assembly : 0 681 343 009

Coening

: 172...175 pressure, bar

Test lines : 1 680 750 014

Outside diameter x Wall thickness

x Length mm : 6.00XZ.00X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke ma : 1.70...1.80

: (1.65...1.85)

Firing order : 1-2-4-5-3

Rack travel in mm : 20.00...22.00

Phasing : 0-72-144-216-288

Tolerance + - \* : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1000

Rack travel in mm : 14.00...14.10

Del.quantity cm3/: 5.1...5.2

100 s: (5.0...5.3)

cm3 : 0.2Spread

100 s: (0.3)

2nd speed rpm : 315.0 Rack travel in mm: 4.9...5.1 Del.quantity cm3/: 0.5...0.6 100 s: (0.4...0.8)

Spread cm3 : 0.1

100 s: (0.15)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000 Aneroid pressure h: 1850

: 51.0...52.0 Del.quantity 1000 : (50.0...53.0)

: 2.50 Spread cm3

1000 : (3,00)

RATED SPEED

1st version

Control lever

position degrees: 50...0 3rd rack travel in: 8.1...8.5

: 2500 Speed rpm 4th rack travel in: 2950

Speed : 0.00...1.00 rpm

SET IDLE CONTROL LEVER

POSITION

: 1000 rpm Rack travel in mm: 1,7...1,8

LOW IDLE 1 Control Lever

position degrees: 812  Setting point w/out bumper spring Speed rpm : 315 Rack travel in mm : 5.0  Testing: Speed rpm : 220 Minimum rack trave: 8.00 Speed rpm : 315 Rack travel in mm : 4.90\$.10 Rack travel in mm : 2.50 Speed rpm : 525625 Speed rpm : 1000 Maximum rack trave: 1.80	Del.quantity cm3/: 48.550.5  1000 s: (47.551.5)  Spread cm3 : 2.50  1000 s: (3.00)  Aneroid pressure h: 1050  Speed rpm : 1000  Del.quantity cm3/: 33.034.0  1000 s: (32.935.0)  Spread cm3 : 2.50  1000 s: (3.00)  STARTING FUEL DELIVERY
SET IDLE AUXILIARY SPRING Speed rpm : 380 Rack travel in mm : 4.204.40 : (4.104.50)	Speed rpm : 100  Del.quantity cm3/ : 52.00.0  1000 s: (52.00.0)  Rack travel in mm : 20.100.00
TORQUE CONTROL  Torque control curve - 1st version  1st speed rpm : 1000  Rack travel in m: 14.0014.10  2nd speed rpm : 1600  Rack travel in m: 13.3013.50  3rd speed rpm : 2200  Rack travel in m: 12.8013.00  Areroid/Altitude  Compensator Test	HIGH IDLE  1st version Aneroid pressure h: 1850 Speed rpm : 2500 Rack travel in mm : 8.108.50 Del.quantity cm3/: 31.035.0 1000 s: (30.036.0) Spread cm3 : 2.50 1000 s: (3.00)
	LOW IDLE
1st version Setting Speed rpm : 1000 Pressure hPa : 1600 Rack travel mm : 0.500.90  Measurement	Speed rpm : 315 Rack travel in mm : 4.905.10 Del.quantity cm3/ : 5.06.0 1000 s: (4.08.5) Spread cm3 : 1.00 1000 s: (1.50)
Speed 1/min: 1000	SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)
1st pressure hPa : 1050 Rack travel in m: 3.904.10 2nd pressure hPa : 750 Rack travel in m: 5.806.20 FUEL DELIVERY CHARACTERISTICS	Control lever at idle stop Speed rpm : 340 Rack travel in mm : (12.413.8) Del.quantity cm3/: - 1000 s: (41.049.0)
1st version Aneroid pressure h: 1850 Speed rpm : 1600 Del.quentity cm3/ : 50.051.5 1000 s: (49.052.5) Spread cm3 : 2.50 1000 s: (3.00) Aneroid pressure h: 1850 Speed rpm : 2200	Current A : 1.8  Control lever at full-load stop Speed rpm : 2950 Rack travel in mm : 0.01.0 Current short-duration A : 3.0 Starting test Speed rpm : 100 Del.quantity cm3/: - min. 1000 s: 52.0 / 1,8A

Sliding sleeve pre-travel = 6.5 mm

CHECKING THE IDLE—SPEED AUXILIARY SPRING CUTOFF
—Control-lever position 49°, max.

0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.

Control-lever position 46.5°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

TESTING PNEUMATIC SHUTOFF DEVICE
-Control lever at idle stop.
With n = 315 1/min. and pu = 450 mbar,
control rod must move quickly to
control-rod travel = 0 mm

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 19.3°...19.7° (19.2...19.8°) angular displacement of cam following start of delivery of cylinder no. 1. Difference in start of delivery between max. and min. value = max. 1° angular displacement of cam

Testing and adjusting the control-rod-travel sensor with evaluation circuit KDEP-P400
Receiving inspection
Shift control lever to full-load stop.
Set 13.5 V at stabilizer. Apply 1850 hPa to ALDA. Run up to speed of 1000 1/min; a voltage of 2,531...2,590 (2,502...2,620) V must be displayed on the digital voltmeter.

Adjustment of the control-rod travel sensor

At a speed of 1000 1/min, set fuel delivery at 18,5...19,5 (17,5...20,5) ccm/1000 strokes with control lever. Shift control-rod-travel sensor until U = 1.633...1.639 (1.635...1.637) V is indicated. Tighten fastening screws

with 1...2 Nm. Control lever to full-

load stop; voltage value of 2,531... 2,590 V must be attained.

Pin projection = 16.60...16.70 mm

CORRECTION OF INJECTED-FUEL QUANTITY -Set max. change plus/minus 0.75 mm control-rod travel at correction screw on ALDA pressure box.

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : MB : 29.10.92 Edition Replaces : 08.07.92 Test oil : ISO-4113 Combination no. : 0 400 075 966 Injection pump Pump designation : PES5M55C32ORS158 EP type number : 0 410 055 986 Governor Governor design. : RSF340/2300M64-11 : 0 420 021 086 Governer no. Cust. part no. : T4 Customer spec. information Customer : MB-PKW : OM602A-Abgast. ALDA Engine 1st version kW : 92.0 TEST BENCH REQUIREMENTS Test oil inlet temp. \*C : 38...42 Overflow valve : 1 469 990 351 Inlet press., bar: 1.00 Test nozzle holder : 0 681 343 009 assembly Opening pressure, bar : 172...175 Test lines : 1 680 750 014 Outside diameter x Wall thickness x Length mm : 6.00x2.00x600 (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

Rack travel in mm : 20.00...22.00 Firing order : 1-2-4-5-3 Phasing : 0-72-144-216-288 Tolerance + - ° : 0.00 (1.00) Time to cyl. no. : 1 BASIC SETTING 1st speed rpm: 1000 Rack travel in mm : 13.90...14.00 Del.quantity cm3/: 5.1...5.2 100 s: (5.0...5.3) Spread cm3 : 0.2100 s: (0.3) 2nd speed rpm : 315.0 Rack travel in mm : 5.4...5.6 Del.quantity cm3/: 0.5...0.6 100 s: (0.4...0.9) cm3 : 0.1Spread 100 s: (0.15) FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 1000 Aneroid pressure h: 1850 Del.quantity : 51.0...52.0 1000 : (50.0...53.0) : 2.50 Spread cm3 1000 : (3.00)RATED SPEED 1st version Control lever position degrees: 50...0 3rd rack travel in: 8.1...8.5 1:pm : 2500 Speed 4th rack travel in: 2950 : 0.00...1.00 Speed rpm SET IDLE CONTROL LEVER POSITION rom Rack travel in mm: 1,7...1,8

LOW IDLE 1

Control lever

per values

BEGINNING OF DELIVERY

Prestroke mm

Test pressure, bar: 30...32

: 2.20...2.30

: (2.15...2.35)

position degrees: 8...12 Del.quantity cm3/: 48.5...50.5 1000 s: (47.5...51.5) Setting point w/out bumper spring Speed COM : 315 Spread cm3 : 2.50 Rack travel in mm: 5.5 1000 s: (3.00) Aneroid pressure h: 1050 Testing: Speed : 1000 rom Del.quantity cm3/: 33.0...34.0 Speed rpm : 220 Minimum rack trave: 8.00 1000 s: (32.0...35.0) : 315 Speed LDW. Spread cm3 : 2.50 Rack travel in mm : 5.40...5.60 1000 s: (3.00) Rack travel in mm : 2.50 Speed rpm : 540...640 rpm : 1000 Speed STARTING FUEL DELIVERY Maximum rack trave: 1.80 SET IDLE AUXILIARY SPRING Speed rpm : 100 rpm : 380 Speed Del.quantity cm3/ : 52.0...0.0 Rack travel in mm: 4,2...4,4 1000 s: (52.0...0.0) : (4,1...4,5) Rack travel in mm : 20.10...0.00 TORQUE CONTROL HIGH IDLE Torque control curve - 1st version rpm : 1000 1st speed 1st version Rack travel in m: 13.90...14.00 Aneroid pressure h: 1850 2nd speed rpm : 1600 rpm : 2500 Rack travel in m: 13.20...13.40 Rack travel in mm : 8.10...8.50 3rd speed rpm : 2200 Del.quantity cm3/: 29.0...33.0 Rack travel in m: 12.30...12.50 1000 s: (28.0...34.0) Spread cm3 : 2.50Aneroid/Altitude 1000 s: (3.00) Compensator Test LOW IDLE 1st version Speed rpm : 315 Setting Rack travel in mm : 5.40...5.60 Speed rom : 1000 Del.quantity cm3/ : 5.5...6.5 Pressure hPa : 1600 1000 s: (4.5...9.0) Rack travel mm : 0.50...0.90 cm3 : 1.00Spread 1000 s: (1.50) Measurement 1/min: 1000 Speed SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR) 1st pressure hPa : 1050 Rack travel in m: 3.90...4.10 2nd pressure hPa : 750 Control lever at idle stop Rack travel in m: 5.80...6.20 Speed rpm : 340 Rack travel in mm : (12,4...13.8) FUEL DELIVERY CHARACTERISTICS Del.quantity cm3/:-1000 s: (41.0...49.0) Current A : 1,8 1st version Aneroid pressure h: 1850 Control lever at full-load stop rpm : 1600 Speed : 2950 Speed rpm Del.quantity cm3/: 50.0...51.5 Rack travel in mm: 0.0...1.0 1000 s: (49.0...52.5) Current cm3 : 2.50 1000 s: (3.00) Spread short-duration A: 3.0 Starting test Aneroid pressure h: 1850 Speed rpm : 100 Speed rpm : 2200 Del.quantity cm3/:-1000 s: 52.0 / 1,8A

Sliding sleeve pre-travel = 6.5 mm

CHECKING THE IDLE—SPEED AUXILIARY SPRING CUTOFF
-Control—lever position 49°, max.
0.2 mm control—red travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.
Control—lever position 46.5°, control—rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

TESTING PNEUMATIC SHUTOFF DEVICE
—Control lever at idle stop.
With n = 315 1/min. and pu = 450 mbar,
control rod must move quickly to
control—rod travel = 0 mm

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 19.3°...19.7° (19.2...19.8°) angular displacement of cam following start of delivery of cylinder no. 1. Difference in start of delivery between max. and min. value = max. 1° angular displacement of cam

CORRECTION OF INJECTED—FUEL QUANTITY—Set max. change plus/minus 0.75 mm control—rod travel at correction screw on ALDA pressure box.

Note remarks

Test sheet

Edition

: 29.10.92

Replaces

: 08.07.92

fest oil

: ISO-4113

Combination no.

: 0 400 075 980

Injection pump

Pump designation : PES5M55C320RS158

EP type number

: 0 410 055 986

Governor

Governor design. : RSF340/2300M64

Governer no.

: 0 420 021 050

Cust. part no.

: T4

Customer-spec. information Customer

: MB-PKW

Engine

: OM602A / ALDA

1st version kW

: 92.0

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 469 990 351

Inlet press., bar: 1.00

Test nozzle holder

assembly

: 0 681 343 009

**Opening** 

pressure, bar

: 172...175

Test Lines

: 1 680 750 014

Outside diameter

x Wall thickness

x Length mm

: 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm

: 2.20...2.30

: (2.15...2.35)

Rack travel in mm : 20.00...22.00

Firing order : 1-2-4-5-3

Phasing

: 0-72-144-216-288

Tolerance + - °

: 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed

rpm: 1000

Rack travel in mm : 13.90...14.00

Del.quantity cm3/ : 5.1...5.2

100 s: (5.0...5.3)

Spread

cm3 : 0.2

100 s: (0.3)

2nd speed rpm : 315.0 Rack travel in mm : 5.4...5.6 Del.quantity cm3/ : 0.5...0.6

100 s: (0.4...0.9)

Spread

cm3 : 0.1

100 s: (0.1)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

rpm : 1000

Aneroid pressure h: 1850

Del.quantity

: 51.0...52.0

1000 : (50.0...53.0)

Spread

: 2.50 Cn3

1000 : (3.00)

RATED SPEED

1st version

Control lever

position degrees: 50...0 3rd rack travel in: 8.1...8.5

rpm : 2500 Speed

4th rack travel in: 2950

Speed

: 0.00...1.00 rom

SET IDLE CONTROL LEVER

**POSITION** 

rpm

: 1000

Rack travel in mm: 1.7...1.8

LOW IDLE 1

Control lever

**M**07

position degrees: 8...12 Del.quantity cm3/: 48.5...50.5 1000 s: (47.5...51.5) Setting point wout bumper spring : 315 COM cm3 : 2.50Spread Rack travel in mm: 5.5 1000 s: (3.00) Aneroid pressure h: 1050 Speed rpm : 1000 Del.quantity cm3/ : 33.0...34.0 Testina: Speed mom : 220 Minimum rack trave: 8.00 **1000 s: (3**2.0...35.0) npm : 315 cm3 : 2.50Spread Rack travel in mm: 5.40...5.60 Rack travel in mm: 2.50 1000 s: (3.00) : 540...640 Speed rpm : 1000 Spe∈d man STARTING FUEL DELIVERY Maximum rack trave: 1.80 SET IDLE AUXILIARY SPRING Speed rpm : 100 Del.quantity cm3/: 52.0...0.0 1000 s: (52.0...0.0) Rack travel in mm: 20.10...0.00 rpm : 380 Speed Rack travel in mm : 4,20...4.40 : (4.10...4.50) TORQUE CONTROL HIGH IDLE Torque control curve - 1st version rpm : 1000 1st speed 1st version Rack travel in m: 13.90...14.00 Aneroid pressure h: 1850 2nd speed nom : 1600 rpm : 2500 Rack travel in m: 13.20...13.40 Rack travel in mm : 8.10...8.50 3rd speed rpm : 2200 Del.quantity cm3/: 29.0...33.0 Rack travel in m: 12.30...12.50 1000 s: (28.0...34.0) cm3 : 2.50 Spread Aneroid/Altitude 1000 s: (3.00) Compensator Test LOW IDLE 1st version Speed rpm : 315 Rack travel in mm : 5.40...5.60 Setting Speed : 1000 rom Del.quantity cm3/: 5.5...6.5 hPa : 1600 Pressure 1000 s: (4.5...9.0) Rack travel mm : 0.50...0.90 cm3 : 1.00Spread 1000 s: (1.50) Measurement Speed 1/min: 1000 SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR) 1st pressure hPa : 1050 Rack travel in m: 3.90...4.10 2nd pressure hPa : 750 Control lever at idle stop Rack travel in m: 5.80...6.20 rpm : 340 Speed Rack travel in mm : (12.4...13.8) FUEL DELIVERY CHARACTERISTICS Del.quantity cm3/: -1000 s: (41.0...49.0) Current A : 1.8 1st version Aneroid pressure h: 1850 Control lever at full-load stop Speed rpm : 1600
Del.quantity cm3/: 50.0...51.5
1000 s: (49.0...52.5)
Spread cm3 : 2.50 rpm : 2950 Speed Rack travel in mm: 0.0...1.0 Current short-duration A: 3.0 1000 s: (3.00) Starting test Aneroid pressure h: 1850 rpm : 100 Speed Speed : 2200 **MCU** Del.quantity cm3/: -1000 s: 52.0 / 1.8A

Sliding sleeve pre-travel = 6.5 mm

CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF
-Control-lever position 49°, max.

3.2 mm: control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.

Control-lever position 46.5°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

TESTING PNEUMATIC SHUTOFF DEVICE
-Control lever at idle stop.
With n = 315 1/min. and pu = 450 mbar,
control rod must move quickly to
control-rod travel = 0 mm

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 19.3°...19.7° (19.2...19.8°) angular displacement of cam following start of delivery of cylinder no. 1. Difference in start of delivery between max. and min. value = max. 1° angular displacement of cam

Testing and adjusting the control-rod-travel sensor with evaluation circuit KDEP-P400 Receiving inspection
Shift control lever to full-load stop. Set 13.5 V at stabilizer. Apply 1850 hPa to ALDA. Run up to speed of 1000 1/min; a voltage of 2.472...2.532 (2.442...2.562) V must be displayed on the digital voltmeter.

Adjustment of the control-rod travel sensor

At a speed of 1000 1/min, set fuel delivery at 23.0...24.0 (22.0...25.0) ccm/1000 strokes with control lever. Shift control-rod-travel sensor until U = 1.633...1.639 (1.635...1.637) V is indicated. Tighten fastening screws with 1...2 Nm. Control lever to full-

load stop; voltage value of 2.472... 2.532 V must be attained.

Pin projection = 16.60...16.70 mm

CORRECTION OF INJECTED-FUEL QUANTITY -Set max. change plus/minus 0.75 mm control-rod travel at correction screw on ALDA pressure box.

Note remarks

Test sheet : MB 3.0 W37 Edition : 29.10.92 Reolaces : 14.10.91 Test oil : ISO-4113

Combination no. : 0 400 076 956

Injection pump

Pump designation : PES6M55C32URS181 EP type number : 0 410 056 983

Governor

Governor design. : RSF305/2125M64-20 : 0 420 021 168 Governer no.

Cust. part no. : T4

Customer-spec. information Customer : MB-PKW

Engine : 0M603A 035 USA

1st version kW : 110.0

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 469 990 351

Inlet press., bar: 1.00

Test nozzle holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

Test Lines : 1 680 750 014

Outside diameter x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 1.70...1.80

: (1.65...1.85)

Rack travel in mm : 20.00...22.00

Firing order : 1-5-3-6-2-4

Phasina : 0-60-120-180-240-300

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1000

Rack travel in mm : 14.10...14.20

Del.quantity cm3/: 5.9...6.0

100 s: (5.8...6.1)

Spread cm3 : 0.2

100 s: (0.3)

2nd speed rpm : 280.0

Rack travel in mm: -

Del.quantity cm3/: 0.5...0.6 100 s: (0.5...0.9)

cm3 : 0.1Spread

100 s: (0.1)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000 Aneroid pressure h: 1900

Del.quantity : 59.0...60.0

1000 : (58.0...61.0) cm3 : 2.50

Spread 1000 : (3.00)

RATED SPEED

1st version

Control lever

position degrees: 50...0 3rd rack travel in: 9.2...9.6

Speed rpm : 2500 4th rack travel in: 2700

: 0.00...1.00 Speed rpm

SET IDLE CONTROL LEVER

POSITION

: 1000 CDM

Rack travel in mm: 1,9...2,0

LOW IDLE 1

Control lever

M10

position degrees: 812 Setting point w/out bumper spring Speed rpm : 280  Testing: Speed rpm : 200 Minimum rack trave: 8.00 Rack travel in mm : 2,5	Aneroid pressure h: 1050 Speed rpm : 1000 Del.quantity cm3/: 38.039.0 1000 s: (37.040.0) Spread cm3 : 2.50 1000 s: (3.00)
Speed rpm : 550650 Speed rpm : 1000 Maximum rack trave: 2.00	STARTING FUEL DELIVERY
SET IDLE AUXILIARY SPRING Speed rpm : 400 Rack travel in mm : 4.34.5 : (4.24.6)	Speed rpm : 100  Del.quantity cm3/: 52.00.0  1000 s: (52.00.0)  Rack travel in mm : 20.100.00  HIGH IDLE
TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1000 Rack travel in m: 14.1014.20 2nd speed rpm : 1600 Rack travel in m: 13.2013.20 3rd speed rpm : 2000 Rack travel in m: 12.2012.50 Aneroid/Altitude	1st version Aneroid pressure h: 1900 Speed rpm : 2300 Rack travel in mm : 9.209.60 Del.quantity cm3/: 37.041.0 1000 s: (36.042.0) Spread cm3 : 2.50 1000 s: (3.00)
Compensator Test	LOW IDLE
1st version Setting Speed rpm : 1000 Pressure hPa : 1600 Rack travel mm : 0.801.20	Speed rpm : 280 Rack travel in mm : - Del.quantity cm3/ : 5.56.5 1000 s: (5.09.5) Spread cm3 : 1.00 1000 s: (1.50)
Measurement Speed 1/min: 1000	SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)
1st pressure hPa : 1050 Rack travel in m: 3.703.90 2nd pressure hPa : 750 Rack travel in m: 5.205.60 FUEL DELIVERY CHARACTERISTICS	Control lever at idle stop Speed rpm : 305 Rack travel in mm : (11.512.9) Del.quantity cm3/:- 1000 s: (41.049.0) Current A : 1.8
1st version Aneroid pressure h: 1900 Speed rpm : 1600 Del.quantity cm3/ : 56.558.0	Control lever at full-load stop Speed rpm : 2700 Rack travel in mm : 0.01.0 Current short-duration A : 3,0 Starting test Speed rpm : 100 Del.quantity cm3/:- min. 1000 s: 52.0 / 1.8A Remarks:

CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position 35,5°, max. 0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min. -Control-lever position 33.0°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

CHECKING THE PNEUMATIC SHUTOFF BOX
-Control lever up against idle stop.
At n = 290 1/min and pu = 450 mbar
control rod must move briskly to
control-rod travel = 0 mm

Pin projection = 16.60...16.70 mm

CORRECTION OF INJECTED-FUEL QUANTITY -Set max. change plus/minus 0.75 mm control-rod travel at correction screw on ALDA pressure box.

Testing and adjusting the control-rodtravel sensor with evaluation circuit KDEP-P400

Receiving inspection
Shift control lever to full-load stop.
Set 13.5 V at stabilizer. Apply
1850 hPa to ALDA. Run up to speed of
1000 1/min; a voltage of 2.487...2.547
(2.457...2.577) V must be displayed
on the digital voltmeter.

Adjustment of the control-rod travel

At a speed of 1000 1/min, set fuel delivery at 24.0...25.0 (23.0...26.0) ccm/1000 strokes with control lever. Shift control-rod-travel sensor until U = 1.633...1.639 (1.635...1.637) V is indicated. Tighten fastening screws with 1...2 Nm. Control lever to full-load stop; voltage value of 2.487... 2.547 V must be attained.

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 16.8°...17.2° (16.7...17.3°) angular displacement of cam following start of delivery of cylinder no. 1.

Difference in start of delivery between max. and min. value = max. 1° angular displacement of cam

Sliding sleeve pre-travel = 5,25...5,75 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks : MB 3.0 W38 : 29.10.92 Test sheet Edition : 14.10.91 Replaces Test oil : ISO-4113 Combination no. : 0 400 076 958 Injection pump Pump designation : PES6M55C32ORS181 EP type number : 0 410 056 983 Governor Governor design. : RSF315/2125M64-19 : 0 420 021 162 Governer no. Cust. part no. : T4 Customer-spec. information Customer : MB-PKW Engine : 0M603A D35 USA 1st version kW : 110.0 TEST BENCH REQUIREMENTS Test oil : 38...42 inlet temp. °C Overflow valve : 1 469 990 351 Inlet press., bar: 1.00 Test nozzle holder : 0 681 343 009 assembly Opening pressure, bar : 172...175 Test lines : 1 680 750 014 Outside diameter x Wall thickness x Length mm : 6.00x2.00x600 (A) Injection pump setting values

Insp. values in parentheses Set equal delivery quant. per values BEGINNING OF DELIVERY Test pressure, bar: 30...32 : 1.70...1.80 Prestroke mm : (1.65...1.85) M13

Rack travel in mm : 20.00...22.00 Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed rom: 1000

Rack travel in mm : 14.10...14.20

Del.quantity cm3/: 5.9...6.0

100 s: (5.8...6.1)

Spread cm3 : 0.2

100 s: (0.3)

2nd speed rpm : 290.0 Rack travel in mm : 5.5...5.7 Del.quantity cm3/ : 0.5...0.6

100 s: (0.5...0.95)

cm3 : 0.1Spread 100 s: (0.15)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000 Aneroid pressure h: 1900

Del.quantity : 59.0...60.0 1000 : (58.0...61.0)

: 2.50 Spread cm3 1000 : (3.00)

RATED SPEED

1st version Control lever

position degrees: 50...0 3rd rack travel in: 9.2...9.6

rpm : 2300 Speed 4th rack travel in: 2700

rpm : 0.00...1.00Speed

SET IDLE CONTROL LEVER POSITION

rpm : 1000 Rack travel in mm : 1.9...2.0

LOW IDLE 1 Control Lever

position degrees: 812 Setting point w/out bumper spring Speed rpm : 290 Rack travel in mm : 5.6  Testing: Speed rpm : 200 Minimum rack trave: 8.00 Rack travel in mm : 2,5 Speed rpm : 550650 Speed rpm : 1000 Maximum rack trave: 2.00	Spread cm3 : 2.50 1000 s: (3.00) Aneroid pressure h: 1050 Speed rpm : 1000 Del.quantity cm3/: 38.039.0 1000 s: (37.040.0) Spread cm3 : 2.50 1000 s: (3.00)
SET IDLE AUXILIARY SPRING Speed rpm : 400 Rack travel in mm : 4.34.5 : (4.24.6)	Speed rpm : 100 - Del.quantity cm3/: 52.00.0 - 1000 s: (52.00.0) - Rack travel in mm : 20.100.00
TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1000 Rack travel in m: 14.1014.20 2nd speed rpm : 1600 Rack travel in m: 13.2013.20 3rd speed rpm : 2000 Rack travel in m: 12.2012.50  Aneroid/Altitude Compensator Test	HIGH IDLE  1st version Aneroid pressure h: 1900 Speed rpm : 2300 Rack travel in mm : 9.209.60 Del.quantity cm3/: 37.041.0 1000 s: (36.042.0) Spread cm3 : 2.50 1000 s: (3.00)
1st version Setting Speed rpm : 1000 Pressure hPa : 1600 Rack travel mm : 0.801.20	Speed rpm : 290 Rack travel in mm : 5.505.70 Del.quantity cm3/ : 5.56.5 1000 s: (5.09.5) Spread cm3 : 1.00 1000 s: (1.50)
Measurement Speed 1/min: 1000  1st pressure hPa: 1050	SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)
Rack travel in m: 3.703.90 2nd pressure hPa : 750 Rack travel in m: 5.205.60 FUEL DELIVERY CHARACTERISTICS	Control lever at idle stop Speed rpm : 315 Rack travel in mm : (11.512.9) Del.quantity cm3/: 1000 s: (41.049.0) Current A : 1.8
1st version Aneroid pressure h: 1900 Speed rpm : 1600 Del.quantity cm3/ : 56.558.0	Control lever at full-load stop Speed rpm : 2700 Rack travel in mm : 0.01.0 Current short-duration A : 3.0 Starting test Speed rpm : 100 Del.quantity cm3/:- min. 1000 s: 52.0 1.8A Remarks:

CHECKING THE IDLE—SPEED AUXILIARY SPRING CUTOFF

-Control—lever position 35,5°, max.

0.2 mm control—rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.

-Control—lever position 33.0°, control—rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

CHECKING THE PNEUMATIC SHUTOFF BOX
-Control lever up against idle stop.
At n = 290 1/min and pu = 450 mbar
control rod must move briskly to
control-rod travel = 0 mm

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 16.8°...17.2° (16.7...17.3°) angular displacement of cam following start of delivery of cylinder no. 1.

Pin projection = 16.60...16.70 mm

CORRECTION OF INJECTED—FUEL QUANTITY—Set max. change plus/minus 0.75 mm control—rod travel at correction screw on ALDA pressure box.

Testing and adjusting the control-rodtravel sensor with evaluation circuit KDEP-P400 Receiving inspection

Shift control lever to full-load stop. Set 13.5 V at stabilizer. Apply 1850 hPa to ALDA. Run up to speed of 1000 1/min; a voltage of 2.487...2.547 (2.457...2.577) V must be displayed on the digital voltmeter.

Adjustment of the control-rod travel sensor

At a speed of 1000 1/min, set fuel delivery at 24.0...25.0 (23.0...26.0) ccm/1000 strokes with control lever. Shift control-rod-travel sensor until U = 1.633...1.639 (1.635...1.637) V is indicated. Tighten fastening screws

with 1...2 Nm. Control lever to full-load stop; voltage value of 2.487... 2.547 V must be attained.

Sliding sleeve pre-travel = 5,25...5,75 mm

BOSCH INU. PUMP TEST SPECIFICATIONS Note remarks : MB 3.0 W39 Test sheet : 29.10.92 Edition Replaces : 14.10.91 Test oil : ISO-4113 Combination no. : 0 400 076 959 Injection pump Pump designation : PES6M55C32ORS180 EP type number : 0 410 056 984 Governor Governor design. : RSF315/2300M64-17 : 0 420 021 157 Governer no. Cust. part no. : T4 Customer-spec. information Customer : MB-PKW Engine : OM603A-D/A (KAT) 1st version kW : 110.0 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 469 990 351 Inlet press., bar: 1.00 Test nozzle holder : 0 681 343 009 assembly Opening pressure, bar : 172...175 Test lines : 1 680 750 014 Outside diameter x Wall thickness x Length mm : 6.00x2.00x600 (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

Rack travel in mm : 20.00...22.00 : 1-5-3-6-2-4 Firing order Phasing : 0-60-120-180-240-300 Tolerance  $+ - \cdot : 0.00 (1.00)$ Time to cyl. no. : 1 BASIC SETTING 1st speed rpm: 1000 Rack travel in mm : 13.70...13.80 Del.quantity cm3/: 5.1...5.2 100 s: (5.0...5.3) Spread cm3 : 0.2100 s: (0.3) 2nd speed rpm : 290.0Rack travel in mm : 5.4...5.6 Del.quantity cm3/: 0.5...0.6 100 s: (0.5...0.95) Spread cm3 : 0.1100 s: (0.15) FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 1000 Aneroid pressure h: 1850 Del.quantity : 51.0...52.0 1000 : (50.0...53.0) Spread : 2.50 cm3 1000 : (3.00) RATED SPEED 1st version Control lever position degrees: 50...0 3rd rack travel in: 8.4...8.8 rpm : 2500 Speed 4th rack travel in: 2950 rpm : 0.00...1.00Speed SET IDLE CONTROL LEVER POSITION rpm : 1000 Rack travel in mm : 1.7...1.8 LOW IDLE 1

Control lever

BEGINNING OF DELIVERY

Prestroke mm

Test pressure, bar: 30...32

: 1.70...1.80

: (1.65...1.85)

position degrees: 812	
	Poel.quantity cm3/: 48.550.5
Setting point w/out bumper spring	1000 s: (47.551.5)
Speed rpm : 290	Spread cm3 : 2.50
Rack travel in mm : 5.5	1000 s: (3,00)
nack travet in iisii . J.J	
Tankina.	Aneroid pressure h: 1050
Testing:	Speed rpm : 1000
Speed rpm : 200	Del.quantity cm3/: 33.034.0
Minimum rack trave: 7.00	1000 s: (32.035.0)
Speed rpm : 290	- Spread cm3 : 2.50
Rack travel in mm : 5.405.60	1000 s: (3.00)
Rack travel in mm : 2.50	
Speed rpm : 520620	<u> </u>
Speed rpm: 1000	STARTING FUEL DELIVERY
Maximum rack trave: 1.80	L STARTING FOLL PELIVERY
The strong the state of the sta	
SET IDLE AUXILIARY SPRING	Connect community
	Speed rpm : 100
Speed rpm: 360	Del.quantity_cm3/ : 52.00.0
Rack travel in mm: 4.24.4	1000 s: (52.00.0)
: (4.14,5)	Rack travel in mm : 20.100.00
	<del> -</del>
TORQUE CONTROL	- GH IDLE
Torque control curve - 1st version	_
1st speed rpm : 1000	1st version
Rack travel in m: 13.7013.80	Aneroid pressure h: 1850
2nd speed rpm : 1600	
Rack travel in m: 13.0013.20	1
	Rack travel in mm: 8.408.80
	Del.quantity_cm3/ : 29.033.0
Rack travel in m: 12.2012.40	1000 s: (28.034.0)
	- Spread cm3 : 2.50
Aneroid/Altitude -	1000 s: (3.00)
Compensator Test	<del> </del>
	LOW IDLE
	-
1st version	Speed rpm : 290
Setting	Rack travel in mm : 5.405.60
Setting : 1000 :	Rack travel in mm : 5.405.60 Del.quantity cm3/: 5.56.5
Speed rpm : 1000 - Pressure hPa : 1600 -	Rack travel in mm : 5.405.60  Del.quantity cm3/ : 5.56.5  1000 s: (5.09.5)
Setting : 1000 :	Rack travel in mm : 5.405.60  Del.quantity cm3/ : 5.56.5  1000 s: (5.09.5)  Spread cm3 : 1.00
Setting Speed rpm : 1000 Pressure hPa : 1600 Rack travel mm : 0.300.70	Rack travel in mm : 5.405.60  Del.quantity cm3/ : 5.56.5  1000 s: (5.09.5)
Setting Speed rpm: 1000 Pressure hPa: 1600 Rack travel mm: 0.300.70  Measurement	Rack travel in mm : 5.405.60  Del.quantity cm3/ : 5.56.5  1000 s: (5.09.5)  Spread cm3 : 1.00  1000 s: (1.50)
Setting Speed rpm : 1000 Pressure hPa : 1600 Rack travel mm : 0.300.70	Rack travel in mm : 5.405.60  Del.quantity cm3/ : 5.56.5  1000 s: (5.09.5)  Spread cm3 : 1.00  1000 s: (1.50)  SETTING/TESTING ELECTRONIC IDLE
Setting Speed rpm: 1000 Pressure hPa: 1600 Rack travel mm: 0.300.70  Measurement Speed 1/min: 1000	Rack travel in mm : 5.405.60  Del.quantity cm3/ : 5.56.5  1000 s: (5.09.5)  Spread cm3 : 1.00  1000 s: (1.50)
Setting Speed rpm: 1000 Pressure hPa: 1600 Rack travel mm: 0.300.70  Measurement Speed 1/min: 1000  1st pressure hPa: 1050	Rack travel in mm : 5.405.60  Del.quantity cm3/ : 5.56.5  1000 s: (5.09.5)  Spread cm3 : 1.00  1000 s: (1.50)  SETTING/TESTING ELECTRONIC IDLE
Setting Speed rpm: 1000 Pressure hPa: 1600 Rack travel mm: 0.300.70  Measurement Speed 1/min: 1000	Rack travel in mm : 5.405.60  Del.quantity cm3/ : 5.56.5  1000 s: (5.09.5)  Spread cm3 : 1.00  1000 s: (1.50)  SETTING/TESTING ELECTRONIC IDLE
Setting Speed rpm: 1000 Pressure hPa: 1600 Rack travel mm: 0.300.70  Measurement Speed 1/min: 1000  1st pressure hPa: 1050 Rack travel in m: 3.403.60	Rack travel in mm: 5.405.60  Del.quantity cm3/: 5.56.5  1000 s: (5.09.5)  Spread cm3: 1.00  1000 s: (1.50)  SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)
Setting Speed rpm: 1000 Pressure hPa: 1600 Rack travel mm: 0.300.70  Measurement Speed 1/min: 1000  1st pressure hPa: 1050	Rack travel in mm: 5.405.60  Del.quantity cm3/: 5.56.5  1000 s: (5.09.5)  Spread cm3: 1.00  1000 s: (1.50)  SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)  Control lever at idle stop
Setting Speed rpm: 1000 Pressure hPa: 1600 Rack travel mm: 0.300.70  Measurement Speed 1/min: 1000  1st pressure hPa: 1050 Rack travel in m: 3.403.60 2nd pressure hPa: 750	Rack travel in mm: 5.405.60  Del.quantity cm3/: 5.56.5  1000 s: (5.09.5)  Spread cm3: 1.00  1000 s: (1.50)  SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)  Control lever at idle stop Speed rpm: 315
Setting Speed rpm: 1000 Pressure hPa: 1600 Rack travel mm: 0.300.70  Measurement Speed 1/min: 1000  1st pressure hPa: 1050 Rack travel in m: 3.403.60 2nd pressure hPa: 750 Rack travel in m: 4.905.30	Rack travel in mm: 5.405.60  Del.quantity cm3/: 5.56.5  1000 s: (5.09.5)  Spread cm3: 1.00  1000 s: (1.50)  SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)  Control lever at idle stop Speed rpm: 315 Rack travel in mm: (13.114.5)
Setting Speed rpm: 1000 Pressure hPa: 1600 Rack travel mm: 0.300.70  Measurement Speed 1/min: 1000  1st pressure hPa: 1050 Rack travel in m: 3.403.60 2nd pressure hPa: 750	Rack travel in mm: 5.405.60  Del.quantity cm3/: 5.56.5  1000 s: (5.09.5)  Spread cm3: 1.00  1000 s: (1.50)  SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)  Control lever at idle stop Speed rpm: 315 Rack travel in mm: (13.114.5) Del.quantity cm3/: -
Setting Speed rpm: 1000 Pressure hPa: 1600 Rack travel mm: 0.300.70  Measurement Speed 1/min: 1000  1st pressure hPa: 1050 Rack travel in m: 3.403.60 2nd pressure hPa: 750 Rack travel in m: 4.905.30	Rack travel in mm: 5.405.60  Del.quantity cm3/: 5.56.5  1000 s: (5.09.5)  Spread cm3: 1.00  1000 s: (1.50)  SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)  Control lever at idle stop Speed rpm: 315 Rack travel in mm: (13.114.5) Del.quantity cm3/: - 1000 s: (43.051.0)
Setting Speed rpm: 1000 Pressure hPa: 1600 Rack travel mm: 0.300.70  Measurement Speed 1/min: 1000  1st pressure hPa: 1050 Rack travel in m: 3.403.60 2nd pressure hPa: 750 Rack travel in m: 4.905.30  FUEL DELIVERY CHARACTERISTICS	Rack travel in mm: 5.405.60  Del.quantity cm3/: 5.56.5  1000 s: (5.09.5)  Spread cm3: 1.00  1000 s: (1.50)  SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)  Control lever at idle stop Speed rpm: 315 Rack travel in mm: (13.114.5) Del.quantity cm3/: -
Setting Speed rpm: 1000 Pressure hPa: 1600 Rack travel mm: 0.300.70  Measurement Speed 1/min: 1000  1st pressure hPa: 1050 Rack travel in m: 3.403.60 2nd pressure hPa: 750 Rack travel in m: 4.905.30  FUEL DELIVERY CHARACTERISTICS	Rack travel in mm: 5.405.60  Del.quantity cm3/: 5.56.5  1000 s: (5.09.5)  Spread cm3: 1.00  1000 s: (1.50)  SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)  Control lever at idle stop Speed rpm: 315 Rack travel in mm: (13.114.5) Del.quantity cm3/: -  1000 s: (43.051.0)  Current A: 1.8
Setting Speed rpm: 1000 Pressure hPa: 1600 Rack travel mm: 0.300.70  Measurement Speed 1/min: 1000  1st pressure hPa: 1050 Rack travel in m: 3.403.60 2nd pressure hPa: 750 Rack travel in m: 4.905.30  FUEL DELIVERY CHARACTERISTICS  1st version Aneroid pressure h: 1850	Rack travel in mm: 5.405.60  Del.quantity cm3/: 5.56.5  1000 s: (5.09.5)  Spread cm3: 1.00  1000 s: (1.50)  SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)  Control lever at idle stop Speed rpm: 315 Rack travel in mm: (13.114.5) Del.quantity cm3/: -  1000 s: (43.051.0) Current A: 1.8  Control lever at full-load stop
Setting Speed rpm: 1000 Pressure hPa: 1600 Rack travel mm: 0.300.70  Measurement Speed 1/min: 1000  1st pressure hPa: 1050 Rack travel in m: 3.403.60 2nd pressure hPa: 750 Rack travel in m: 4.905.30  FUEL DELIVERY CHARACTERISTICS  1st version Aneroid pressure h: 1850 Speed rpm: 1600	Rack travel in mm: 5.405.60  Del.quantity cm3/: 5.56.5  1000 s: (5.09.5)  Spread cm3: 1.00  1000 s: (1.50)  SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)  Control lever at idle stop Speed rpm: 315 Rack travel in mm: (13.114.5) Del.quantity cm3/: -  1000 s: (43.051.0) Current A: 1.8  Control lever at full-load stop Speed rpm: 100
Setting Speed rpm: 1000 Pressure hPa: 1600 Rack travel mm: 0.300.70  Measurement Speed 1/min: 1000  1st pressure hPa: 1050 Rack travel in m: 3.403.60 2nd pressure hPa: 750 Rack travel in m: 4.905.30  FUEL DELIVERY CHARACTERISTICS  1st version Aneroid pressure h: 1850 Speed rpm: 1600 Del.quantity cm3/: 50.051.5	Rack travel in mm: 5.405.60  Del.quantity cm3/: 5.56.5  1000 s: (5.09.5)  Spread cm3: 1.00  1000 s: (1.50)  SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)  Control lever at idle stop Speed rpm: 315 Rack travel in mm: (13.114.5) Del.quantity cm3/: -  1000 s: (43.051.0) Current A: 1.8  Control lever at full-load stop
Speed rpm : 1000 Pressure hPa : 1600 Rack travel mm : 0.300.70  Measurement Speed 1/min : 1000  1st pressure hPa : 1050 Rack travel in m: 3.403.60 2nd pressure hPa : 750 Rack travel in m: 4.905.30  FUEL DELIVERY CHARACTERISTICS  1st version Aneroid pressure h: 1850 Speed rpm : 1600 Del.quantity cm3/ : 50.051.5 1000 s: (49.052.5)	Rack travel in mm: 5.405.60  Del.quantity cm3/: 5.56.5  1000 s: (5.09.5)  Spread cm3: 1.00  1000 s: (1.50)  SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)  Control lever at idle stop Speed rpm: 315 Rack travel in mm: (13.114.5) Del.quantity cm3/: -  1000 s: (43.051.0) Current A: 1.8  Control lever at full-load stop Speed rpm: 100
Speed rpm : 1000 Pressure hPa : 1600 Rack travel mm : 0.300.70  Measurement Speed 1/min : 1000  1st pressure hPa : 1050 Rack travel in m: 3.403.60 2nd pressure hPa : 750 Rack travel in m: 4.905.30  FUEL DELIVERY CHARACTERISTICS  1st version Aneroid pressure h: 1850 Speed rpm : 1600 Del.quantity cm3/ : 50.051.5 1000 s: (49.052.5) Spread cm3 : 2.50	Rack travel in mm: 5.405.60  Del.quantity cm3/: 5.56.5  1000 s: (5.09.5)  Spread cm3 : 1.00  1000 s: (1.50)  SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)  Control lever at idle stop Speed rpm : 315 Rack travel in mm: (13.114.5) Del.quantity cm3/: -  1000 s: (43.051.0) Current A : 1.8  Control lever at full-load stop Speed rpm : 100 Rack travel in mm: 0.01.0
Speed rpm : 1000 Pressure hPa : 1600 Rack travel mm : 0.300.70  Measurement Speed 1/min : 1000  1st pressure hPa : 1050 Rack travel in m: 3.403.60 2nd pressure hPa : 750 Rack travel in m: 4.905.30  FUEL DELIVERY CHARACTERISTICS  1st version Aneroid pressure h: 1850 Speed rpm : 1600 Del.quantity cm3/ : 50.051.5 1000 s: (49.052.5)	Rack travel in mm: 5.405.60  Del.quantity cm3/: 5.56.5  1000 s: (5.09.5)  Spread cm3: 1.00  1000 s: (1.50)  SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)  Control lever at idle stop Speed rpm: 315 Rack travel in mm: (13.114.5) Del.quantity cm3/: -  1000 s: (43.051.0) Current A: 1.8  Control lever at full-load stop Speed rpm: 100 Rack travel in mm: 0.01.0 Current short-duration A: 3.0
Speed rpm : 1000 Pressure hPa : 1600 Rack travel mm : 0.300.70  Measurement Speed 1/min : 1000  1st pressure hPa : 1050 Rack travel in m: 3.403.60 2nd pressure hPa : 750 Rack travel in m: 4.905.30  FUEL DELIVERY CHARACTERISTICS  1st version Aneroid pressure h: 1850 Speed rpm : 1600 Del.quantity cm3/ : 50.051.5 1000 s: (49.052.5) Spread cm3 : 2.50 1000 s: (3.0)	Rack travel in mm: 5.405.60  Del.quantity cm3/: 5.56.5  1000 s: (5.09.5)  Spread cm3: 1.00  1000 s: (1.50)  SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)  Control lever at idle stop Speed rpm: 315 Rack travel in mm: (13.114.5) Del.quantity cm3/: -  1000 s: (43.051.0) Current A: 1.8  Control lever at full-load stop Speed rpm: 100 Rack travel in mm: 0.01.0 Current short-duration A: 3.0 Starting test
Speed rpm: 1000 Pressure hPa: 1600 Rack travel mm: 0.300.70  Measurement Speed 1/min: 1000  1st pressure hPa: 1050 Rack travel in m: 3.403.60 2nd pressure hPa: 750 Rack travel in m: 4.905.30  FUEL DELIVERY CHARACTERISTICS  1st version Aneroid pressure h: 1850 Speed rpm: 1600 Del.quantity cm3/: 50.051.5 1000 s: (49.052.5) Spread cm3: 2.50 1000 s: (3.0) Aneroid pressure h: 1850	Rack travel in mm: 5.405.60  Del.quantity cm3/: 5.56.5  1000 s: (5.09.5)  Spread cm3: 1.00  1000 s: (1.50)  SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)  Control lever at idle stop Speed rpm: 315 Rack travel in mm: (13.114.5) Del.quantity cm3/: -  1000 s: (43.051.0) Current A: 1.8  Control lever at full-load stop Speed rpm: 100 Rack travel in mm: 0.01.0 Current short-duration A: 3.0 Starting test Speed rpm: 100
Speed rpm : 1000 Pressure hPa : 1600 Rack travel mm : 0.300.70  Measurement Speed 1/min : 1000  1st pressure hPa : 1050 Rack travel in m: 3.403.60 2nd pressure hPa : 750 Rack travel in m: 4.905.30  FUEL DELIVERY CHARACTERISTICS  1st version Aneroid pressure h: 1850 Speed rpm : 1600 Del.quantity cm3/ : 50.051.5 1000 s: (49.052.5) Spread cm3 : 2.50 1000 s: (3.0)	Rack travel in mm: 5.405.60  Del.quantity cm3/: 5.56.5  1000 s: (5.09.5)  Spread cm3: 1.00  1000 s: (1.50)  SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)  Control lever at idle stop Speed rpm: 315 Rack travel in mm: (13.114.5) Del.quantity cm3/: -  1000 s: (43.051.0)  Current A: 1.8  Control lever at full-load stop Speed rpm: 100 Rack travel in mm: 0.01.0  Current short-duration A: 3.0 Starting test Speed rpm: 100 Del.quantity cm3/: -
Speed rpm: 1000 Pressure hPa: 1600 Rack travel mm: 0.300.70  Measurement Speed 1/min: 1000  1st pressure hPa: 1050 Rack travel in m: 3.403.60 2nd pressure hPa: 750 Rack travel in m: 4.905.30  FUEL DELIVERY CHARACTERISTICS  1st version Aneroid pressure h: 1850 Speed rpm: 1600 Del.quantity cm3/: 50.051.5 1000 s: (49.052.5) Spread cm3: 2.50 1000 s: (3.0) Aneroid pressure h: 1850	Rack travel in mm: 5.405.60  Del.quantity cm3/: 5.56.5  1000 s: (5.09.5)  Spread cm3: 1.00  1000 s: (1.50)  SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)  Control lever at idle stop Speed rpm: 315 Rack travel in mm: (13.114.5) Del.quantity cm3/: -  1000 s: (43.051.0) Current A: 1.8  Control lever at full-load stop Speed rpm: 100 Rack travel in mm: 0.01.0 Current short-duration A: 3.0 Starting test Speed rpm: 100

Remarks:

Sliding sleeve pre-travel = 6.5 mm

CHECKING THE PNEUMATIC SHUTOFF BOX
-Control lever up against idle stop.
At n = 290 1/min and pu = 450 mbar
control rod must move briskly to
control-rod travel = 0 mm

CHECKING THE IDLE—SPEED AUXILIARY SPRING CUTOFF
-Control-lever position 35,5°, max.
0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.
-Control-lever position 33.0°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 16.8°...17.2° (16.7...17.3°) angular displacement of cam following start of delivery of cylinder no. 1.

Pin projection = 16.60...16.70 mm

CORRECTION OF INJECTED-FUEL QUANTITY
-Set max. change plus/minus 0.75 mm
control-rod travel at correction
screw on ALDA pressure box.

Testing and adjusting the control-rod-travel sensor with evaluation circuit KDEP-P400
Receiving inspection
Shift control lever to full-load stop.
Set 13.5 V at stabilizer. Apply 1850 hPa to ALDA. Run up to speed of 1000 1/min; a voltage of 2.457...2.517 (2.427...2.547) V must be displayed on the digital voltmeter.

Adjustment of the control-rod travel sensor

At a speed of 1000 1/min, set fuel delivery at 21.0...22.0 (20.0...23.0) ccm/1000 strokes with control lever. Shift control-rod-travel sensor until U = 1.633...1.639 (1.635...1.637) V is indicated. Tighten fastening screws with 1...2 Nm. Control lever to full-load stop; voltage value of 2.457... 2.517 V must be attained.

Note remarks

Test sheet : MB 3.0 W28 Edition : 29.10.92

Replaces : 14.10.91 Test oil : ISO-4113

Combination no. : 0 400 076 962

Injection pump

Pump designation : PES6M55C32ORS157 EP type number : 0 410 056 993

Governor

Governor design. : RSF315/2300M64-15

: 0 420 021 143 Governer no.

Cust. part no. : T4

Customer-spec. information : ME-PKW Customer

Engine : OM603A-Abgast.

1st version kW : 110.0

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 469 990 351

Inlet press., bar: 1.00

Test nozzle holder

assembly : 0 681 343 009

Openina

pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY Test pressure, bar: 30...32

Prestroke mm : 2.20...2.30

: (2.15,...2.35)

Rack travel in mm : 20.00...22.00 Firing order : 1-5-3-6-2-4

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1000

Rack travel in mm : 13.90...14.00

Del.quantity cm3/ : 5.1...5.2

100 s: (5.0...5.3)

Spread cm3 : 0.2

100 s: (0.3)

2nd speed nom : 290.0

Rack travel in mm: 5.3...5.5 Del.quaritity cm3/: 0.5...0.6

100 s: (0.5...0.95)

cm3 : 0.1Spread

100 s: (0.15)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000 Aneroid pressure h: 1850

Del.quantity : 51.0...53.0)

Spread

cm3 : 2.50 1000 : (3.00)

RATED SPEED

1st version

Control lever

position degrees: 50...0 3rd rack travel in: 8.1...8.5

rpm : 2500 Speed

4th rack travel in: 2950

rpm : 0.00...1.00 Speed

SET IDLE CONTROL LEVER **POSITION** 

rpm : 1000 Rack travel in mm: 1,7...1,8

LOW IDLE 1 Control lever

position degrees: 812 Setting point w/out bumper spring Speed rpm : 290 Rack travel in mm : 5.4	Del.quantity cm3/: 48.550.5 1000 s: (47.551.5) Spread cm3 : 2.50 1000 s: (3.00) Aneroid pressure h: 1050
Testing: Speed rpm : 200 Minimum rack trave: 7.00 Speed rpm : 290 Rack travel in mm : 5.305.50 Rack travel in mm : 2.50 Speed rpm : 510610	Speed rpm : 1000 
Speed rpm : 1000 Maximum rack trave: 1.80	+ STARTING FUEL DELIVERY
SET IDLE AUXILIARY SPRING Speed rpm : 360 Rack travel in mm : 4.24.4 : (4.14.5)	Speed rpm : 100  Del.quantity cm3/ : 52.00.0  1000 s: (52.00.0)  Rack travel in mm : 20.100.00
TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1000 Rack travel in m: 13.9014.00 2nd speed rpm : 1600 Rack travel in m: 13.1013.30 3rd speed rpm : 2200 Rack travel in m: 12.3012.50	HIGH IDLE  1st version Aneroid pressure h: 1850 Speed rpm : 2500 Rack travel in mm : 8.108.50 Del.quantity cm3/: 29.033.0 1000 s: (28.934.0) Spread cm3 : 2.50
Aneroid/Altitude Compensator Test	1000 s: (3.00) LOW IDLE
1st version Setting Speed rpm : 1000 Pressure hPa : 1600 Rack travel mm : 0.500.90	Speed rpm : 290 Rack travel in mm : 5.305.50 Del.quantity cm3/ : 5.56.5 1000 s: (5.09.5) Spread cm3 : 1.00 1000 s: (1.50)
Measurement Speed 1/min: 1000	SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)
1st pressure hPa : 1050 Rack travel in m: 3.904.20 2nd pressure hPa : 750 Rack travel in m: 5.706.10 FUEL DELIVERY CHARACTERISTICS	Control lever at idle stop Speed rpm : 315 Rack travel in mm : (12.614.0) Del.quantity cm3/:- 1000 s: (41.049.0)
1st version Aneroid pressure h: 1850 Speed rpm : 1600 Del.quantity cm3/ : 50.051.5	Control lever at full-load stop Speed rpm : 100 Rack travel in mm : 0.01.0 Current Short-duration A : 3.0 Starting test Speed rpm : 100 Del.quantity cm3/:- min. 1000 s: 52.0 1.8A

Remarks:

Sliding sleeve pre-travel = 6.5 mm

CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF
-Control-lever position 35,5°, max.
0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.
-Control-lever position 33.0°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

CHECKING THE PNEUMATIC SHUTOFF BOX -Control lever up against idle stop. At n = 290 1/min and pu = 450 mbar control rod must move briskly to control-rod travel = 0 mm

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 19.3°...19.7° (19.2...19.8°) angular displacement of cam following start of delivery of cylinder no. 1. Pin projection = 16.60...16.70 mm

CORRECTION OF INJECTED-FUEL QUANTITY -Set max. change plus/minus 0.75 mm control-rod travel at correction screw on ALDA pressure box.

Testing and adjusting the control-rod-travel sensor with evaluation circuit KDEP-P400
Receiving inspection
Shift control lever to full-load stop.
Set 13.5 V at stabilizer. Apply 1850 hPa to ALDA. Run up to speed of 1000 1/min; a voltage of 2.472...2.532 (2.442...2.562) V must be displayed on the digital voltmeter.

Adjustment of the control-rod travel sensor
At a speed of 1000 1/min, set fuel

delivery at 23.0...24.0 (22.0...25.0) ccm/1000 strokes with control lever. Shift control-rod-travel sensor until U = 1.633...1.639 (1.635...1.637) V is indicated. Tighten fastening screws with 1...2 Nm. Control lever to full-load stop; voltage value of 2.472... 2.532 V must be attained.

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : MB : 29.10.92 Edition : 01.09.92 Replaces Test oil : ISO-4113 Combination no. : 0 400 076 968 Injection pump Pump designation : PES6M55C32ORS178 EP type number : 0 410 056 986 Governor Governor design. : RSF315/2125M64-13 Governer no. : 0 420 021 128 Cust. part no. : T4 Customer-spec, information Customer : MB-PKW : OM603A D35 USA ALDA Engine 1st version kW : 100.0 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 469 990 351 Inlet press., bar: 1.00 Test nozzle holder assembly : 0 681 343 009 Openina : 172...175 pressure, bar Test lines : 1 680 750 014 Outside diameter x Wall thickness x Length mm : 6.00X2.00X600 (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY Test pressure, bar: 30...32 Prestroke mm : 1.70...1.80 : (1.65...1.85) M22

Rack travel in mm : 20.00...22.00 : 1-5- 3- 6- 2- 4 Firina order : 0-60-120-180-240-300 Phasing Tolerance + - ° : 0.60 (1.00) Time to cyl. no. : 1 BASIC SETTING 1st speed rpm: 1000 Rack travel in mm : 13.70...13.30 Del.quantity cm3/: 5.8...5.9 100 s: (5.7...6.0) Spread cm3 : 0.2100 s: (0.3) rpm : 290.02nd speed Rack travel in mm: 5.6...5.9 Del.quantity cm3/: 0.5...0.6 100 s: (0.5...0.9) cm3 : 0.1 Spread 100 s: (0.1) FULL LOAD DELIV. AT FULL LOAD STOP 1st version rpm : 1000 Speed Aneroid pressure h: 1850 Del.quantity : 58.0...59.0 1000 : (57.0...60.0) : 2.50 Spread cm3 1000 : (3.00) RATED SPEED 1st version Control lever position degrees: 50...0 3rd rack travel in: 6.5...6.9 Speed rpm: 2300 4th rack travel in: 2700 : 0.00...1.00 Speed rpm SET IDLE CONTROL LEVER POSITION : 1000 rpm Rack travel in mm: 1,4...1,5 LOW IDLE 1

Control lever

position degrees: 812	- Spread cm3 : 2.50
Setting point w/out bumper spring	1000 s: (3.00)
Speed rpm : 290 Rack travel in mm : 5.7	Aneroid pressure h: 1050
rack cravet in him . 5.7	- Speed rpm : 1000 - Del.quantity cm3/ : 38.039.0
Testing:	1000 s: (37.040.0)
Speed rpm : 200	- Spread cm3 : 2.50
Minimum rack trave: 7.00	1000 s: (3.00)
Speed rpm : 290	†
Rack travel in mm: 5.605.90 - Speed rpm: 1000 -	† STARTING FUEL DELIVERY
Maximum rack trave: 1.50	T STAKE ING FUEL DELIVER!
	1
SET IDLE AUXILIARY SPRING	Speed rpm : 100
Speed rpm: 400	Del.quantity cm3/: 52.00.0
Rack travel in mm: 3,604,10 : (3,504,20)	1000 s: (52.00.0)  Rack travel in mm : 20.100.00
• (5,504,20)	T Rack travet in min : 20.100.00
TORQUE CONTROL	HIGH IDLE
Torque control curve - 1st version	+
1st speed rpm : 1000	1st version
Rack travel in m: 13.7013.80 - 2nd speed rpm : 1600 -	+ Aneroid pressure h: 1850 - Speed rom : 2300
Rack travel in m: 12,7012.90	Speed
3rd speed rpm : 2000 -	Del.quantity cm3/: 22.026.0
Rack travel in m: 11.3011.50	1000 s: (21.027.0)
A	- Spread cm3 : 2.50
Aneroid/Altitude - Compensator Test -	1000 s: (3.00)
compensator rest	T LOW IDLE
-	LOW IDEA
1st version -	- Speed rpm : 290
Setting -	Rack travel in mm : 5.605.90
Speed rpm : 1000 - Pressure hPa : 1600 -	Del.quantity cm3/: 5.56.5
Rack travel mm : 0.400.80	1000 s: (5.09.5) Spread cm3 : 1.00
	1000 s: (1.50)
Measurement -	+
Speed 1/min: 1000 -	SETTING/TESTING ELECTRONIC IDLE
1st pressure hPa : 1050	REGULATION (ELR)
Rack travel in m: 3.503.70	I
2nd pressure hPa : 750	Control lever at idle stop
Rack travel in m: 5.005.40	Speed rpm : 315
BIEL DELIVERY CHARACTERICITACO	Rack travel in mm : (11,713,1)
FUEL DELIVERY CHARACTERISTICS -	Del.quantity cm3/ : -
•	1000 s: (41,049,0) Current A : 1,8
1st version -	1
Aneroid pressure h: 1850 -	Control lever at full-load stop
Speed rpm: 1600 -	Speed rpm : 2700
Del.quantity cm3/: 54.556.0 - 1000 s: (53.557.0) -	Rack travel in mm : 0,01,0 Current
Spread cm3 : 2.50 -	short-duration A : 3,0
1000 s: (3.0)	Starting test
Aneroid pressure h: 1850	Speed rpm : 100
Speed rpm : 2000 Del.quantity cm3/: 49.051.0	bel.quantity cm3/:-
1000 s: (48.052.0)	min. 1000 s: 52,0 1,8A
	Remarks:
	9

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 16.8°...17.2° (16.7...17.3°) angular displacement of cam following start of delivery of cylinder no. 1.

Difference in start of delivery between max. and min. value = max. 1° angular displacement of cam

CORRECTION OF INJECTED-FUEL QUANTITY -Set max. change plus/minus 0.75 mm control-rod travel at correction screw on ALDA pressure box.

Sliding sleeve pre-travel = 5.5 mm

CHECKING THE IDLE—SPEED AUXILIARY SPRING CUTOFF
-Control-lever position 44,5° max.
0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.
-Control-lever position 42,0°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

CHECKING THE PNEUMATIC SHUTOFF BOX

-Control lever up against idle stop. At n = 290 1/min and pu = 450 mbar control rod must move briskly to control-rod travel = 0 mm

Note remarks

Test sheet

Edition : 29.10.92 Replaces : 08.07.92 : ISO-4113 Test oil

: 0 400 076 980 Combination no.

Injection pump

Pump designation : PES6M55C32ORS157 EP type number : 0 410 056 993

Governor

Governor design.: RSF315/2300M64-10

Governer no. : 0 420 021 085

Cust. part no. : T4

Customer-spec. information Customer : MB-PKW

Engine : OM603A / ALDA

1st version kW : 110.0

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 469 990 351

Inlet press., bar: 1.00

Test nozzle holder

assembly : 0 681 343 009

**Opening** 

pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.20...2.30

: (2.15...2.35)

Rack travel in mm : 20.00...22.00

: 1-5-3-6-2-4 Firing order

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1000

Rack travel in mm : 13.90...14.00

Del.quantity cm3/: 5.1...5.2

100 s: (5.0...5.3)

Spread cm3 : 0.2

100 s: (0.3)

2nd speed rpm : 290.0 Rack travel in mm : 5.3...5.5

Del.quantity cm3/: 0.5...0.6 100 s: (0.5...0.9)

cm3 : 0.1 Spread

100 s: (0.15)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000 Aneroid pressure h: 1850

: 51.0...52.0 Del.quantity

1000 : (50.0...53.0) cm3 : 2.50

Spread 1000 : (3.00)

RATED SPEED

1st version

Control lever

position degrees: 50...0 3rd rack travel in: 8.1...8.5

rpm : 2500 Speed 4th rack travel in: 2950

: 0.00...1.00 Speed rpm

SET IDLE CONTROL LEVER

POSITION

: 1000 rpm

Rack travel in mm: 1.7...1.8

LOW IDLE 1

Control Lever

position degrees: 812 Setting point w/out bumper spring Speed rpm : 290 Rack travel in mm : 5.4  Testing: Speed rpm : 200 Minimum rack trave: 7.00 Speed rpm : 290 Rack travel in mm : 5.305.50 Rack travel in mm : 2.50 Speed rpm : 510610	Del.quantity cm3/: 48.550.5 1000 s: (47.551.5) Spread cm3 : 2.50 1000 s: (3.00) Aneroid pressure h: 1059 Speed rom : 1000 Del.quantity cm3/: 33.034.0 1000 s: (32.035.0) Spread cm3 : 2.50 1000 s: (3.00)
Speed rpm : 1000 Maximum rack trave: 1.80	STARTING TUEL DELIVERY
SET IDLE AUXILIARY SPRING Speed rpm : 360 Rack travel in mm : 4,24,4 : (4,14,5)	Speed rpm : 100 Del.quantity cm3/: 52.00.0 1000 s: (52.00.0) Rack travel in mm : 20.100.00
TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1000 Rack travel in m: 13.9014.00 2nd speed rpm : 1600 Rack travel in m: 13.2013.40 3rd speed rpm : 2200 Rack travel in m: 12.3012.50 Aneroid/Altitude	HIGH IDLE  1st version Aneroid pressure h: 1850 Speed rpm : 2500 Rack travel in mm : 8.108.50 Del.quantity cm3/: 29.033.0 1000 s: (28.034.0) Spread cm3 : 2.50 1000 s: (3.00)
Compensator Test	LOW IDLE
1st version Setting Speed rpm : 1000 Pressure hPa : 1600 Rack travel mm : 0.500.90	Speed rpm: 290 Rack travel in mm: 5.305.50 Del.quantity cm3/: 5.56.5 1000 s: (5.09.5) Spread cm3: 1.60 1000 s: (1.50)
Measurement Speed 1/min: 1000	+ SETTING/TESTING ELECTRONIC IDLE + REGULATION (ELR)
1st pressure in a : 1050 Rack travel in m: 3.904.10 2nd pressure hPa : 750 Rack travel in m: 5.806.20 FUEL DELIVERY CHARACTERISTICS	Control lever at idle stop Speed rpm : 315 Rack travel in mm : (12.814.2) Del.quantity cm3/:- 1000 s: (42.049.9) Current A : 1.8
1st version Aneroid pressure h: 1850 Speed rpm : 1600 Del.quantity cm3/: 50.051.5	Control lever at full-load stop Speed rpm : 2950 Rack travel in mm : 0.01.0 Current short-duration A : 3.0 Starting test Speed rpm : 100 Del.quantity cm3/:- min. 1000 s: 52.0 / 1.8A

Remarks:

Sliding sleeve pre-travel = 6.5 mm

CHECKING THE IDLE—SPEED AUXILIARY SPRING CUTOFF
—Control—lever position 49°, max.

0.2 mm control—rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.

Control—lever position 46.5°, control—rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

CHECKING THE PNEUMATIC SHUTOFF BOX
-Control lever up against idle stop.
At n = 290 1/min and pu = 450 mbar
control rod must move briskly to
control-rod travel = 0 mm

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 19.3°...19.7° (19.2...19.8°) angular displacement of cam following start of delivery of cylinder no. 1. Difference in start of delivery between max. and min. value = max. 1° angular displacement of cam

Testing and adjusting the control-rod-travel sensor with evaluation circuit KDEP-P400
Receiving inspection
Shift control lever to full-load stop.
Set 13.5 V at stabilizer. Apply 1850 hPa to ALDA. Run up to speed of 1000 1/min; a voltage of 2.472...2.532 (2.442...2.562) V must be displayed on the digital voltmeter.

Adjustment of the control-rod travel sensor
At a speed of 1000 1/min, set fuel delivery at 23.0...24.0 (22.0...25.0) ccm/1000 strokes with control lever. Shift control-rod-travel sensor until U = 1.633...1.639 (1.635...1.637) V is

indicated. Tighten fastening screws with 1...2 Nm. Control lever to full-load stop; voltage value of 2.472... 2.532 V must be attained.

Pin projection = 16.60...16.70 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : MB Edition : 29.10.92 Replaces : 08.07.92 Test oil : ISO-4113 Combination nc. : 0 400 076 987 Injection pump Pump designation : PES6M55c320RS157 EP type number : 0 410 056 993 Governor Governor design. : RSF315/2300M64-2 Governer no. : 0 420 021 059 Cust. part no. : T4 Customer-spec. information Customer : MB-PKW Engine : 0M603A / ALDA 1st version kW : 110.0 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 469 990 351 Inlet press., bar: 1.00 Test nozzle holder : 0 681 343 009 assembly Openina pressure, bar : 172...175 Test Lines : 1 680 750 014 Outside diameter x Wall thickness x Length mm : 6.00x2.00x600 (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

Rack travel in mm : 20.00...22.00 : 1-5-3-6-2-4 Firing order Phasing : 0-60-120-180-240-300 Tolerance + - \* : 0.00 (1.00) Time to cyl. no. : 1 BASIC SETTING 1st speed rpm: 1000 Rack travel in mm : 13.90...14.00 Del.quantity cm3/ : 5.1...5.2 100 s: (5.0...5.3) Spread cm3 : 0.2100 s: (0.3) rpm : 290.0 2nd speed Rack travel in mm: 5.3...5.5 Del.quantity cm3/: 0.5...0.6 100 s: (0.5...0.9) cm3 : 0.1 Spread 100 s: (0.15) FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 1000 Aneroid pressure h: 1850 Del.quantity : 51.0...53.0) Spread cm3 : 2.50 1000 : (3.00) RATED SPEED 1st version Control lever position degrees: 50...0 3rd rack travel in: 8.1...8.5 Speed rpm : 2500 4th rack travel in: 2950 Speed rpm : 0.00...1.00SET IDLE CONTROL LEVER POSITION : 1000 rpm Rack travel in mm: 1.7...1.8 LOW IDLE 1

Control Lever

BEGINNING OF DELIVERY

Prestroke mm

Test pressure, bar: 30...32

: 2.20...2.30

: (2.15...2,35)

Del.quantity cm3/: 48.5...50.5 1000 s: (47.5...51.5) position degrees: 8...12 Setting point w/out bumper spring Spread cm3 : 2.50 1000 s: (3.00) Aneroid pressure h: 1050 תוכרו : 290 Rack travel in mm: 5.4 Speed rpm : 1000 Del.quantity cm3/: 33.0...34.0 1000 s: (32.0...35.0) Testina: Speed rpm : 200 Minimum rack trave: 7.00 Speed rpm : 290
Rack travel in mm : 5.30...5.50
Rack travel in mm : 2.50
Speed rpm : 510...610 Spread cm3 : 2.50 1000 s: (3.00) Speed : 1000 rpm STARTING FUEL DELIVERY Maximum rack trave: 1.80 SET IDLE AUXILIARY SPRING Speed : 100 rpm Del.quantity cm3/: 52.0...0.0 1000 s: (52.0...0.0) Speed rpm : 360 Rack travel in mm : 4.20...4.40 : (4.10...4.50) Rack travel in mm : 20.10...0.00 TORQUE CONTROL HIGH IDLE Torque control curve - 1st version 1st speed rpm : 1000 1st version Rack travel in m: 13.90...14.00 and speed rpm : 1600 Rack travel in m: 13.20...13.40 Aneroid pressure h: 1850 2nd speed rpm : 2500 Speed Rack travel in mm : 8.10...8.50 3rd speed rpm : 2200 Del.quantity cm3/: 29.0...33.0 Rack travel in m: 12.30...12.50 1600 s: (28.0...34.0) Spread cm3 : 2.50 Aneroid/Altitude 1000 s: (3.00) Compensator Test LOW IDLE Speed rpm : 290
Rack travel in mm : 5.30...5.50
Del.quantity cm3/ : 5.5...6.5
1000 s: (5.0...9.5) 1st version Setting Speed : 1000 rpm Pressure hPa : 1600 Rack travel mm : 0.50...0.90 cm3 : 1.00 Spiread 1000 s: (1.50) Measurement 1/min: 1000 Speed SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR) 1st pressure hPa : 1050 Rack travel in m: 3.90...4.10 2nd pressure hPa : 750 Control lever at idle stop Rack travel in m: 5.80...6.20 : 315 rpm Rack travel in mm : (12.8...14.2) Del.quantity cm3/: -1000 s: (42.0...49.0) FUEL DELIVERY CHARACTERISTICS Current A 1st version Aneroid pressure h: 1850 Control lever at full-load stop : 1600 Speed rpm : 2950 rom Speed Del.quantity cm3/: 50.0...51.5 1000 s: (49.0...52.5) Rack travel in mm: 0.0...1.0 Current : 2.50 Spread cm3short-duration A: 3,0 1000 s: (3.00) Starting test Aneroid pressure h: 1850 Speed rpm Del.quantity cm3/: -min. 1000 s: 52.0 Speed : 2200 rom

Remarks:

Sliding sleeve pre-travel = 6.5 mm

CHECKING THE IDLE—SPEED AUXILIARY SPRING CUTOFF
-Control—lever position 49°, max.
0.2 mm control—rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.
Control—lever position 46.5°, control—rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

CHECKING THE PNEUMATIC SHUTOFF BOX
-Control lever up against idle stop.
At n = 290 1/min and pu = 450 mbar
control rod must move briskly to
control-rod travel = 0 mm

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 19.3°...19.7° (19.2...19.8°) angular displacement of cam following start of delivery of cylinder no. 1. Difference in start of delivery between max. and min. value = max. 1° angular displacement of cam

Testing and adjusting the control-rod-travel sensor with evaluation circuit KDEP-P400
Receiving inspection
Shift control lever to full-load stop.
Set 13.5 V at stabilizer. Apply 1850 hPa to ALDA. Run up to speed of 1000 1/min; a voltage of 2.472...2.532 (2.442...2.562) V must be displayed on the digital voltmeter.

Adjustment of the control-rod travel sensor
At a speed of 1000 1/min, set fuel delivery at 23.0...24.0 (22.0...25.0) ccm/1000 strokes with control lever. Shift control-rod-travel sensor until U = 1.633...1.639 (1.635...1.637) V is

indicated. Tighten fastening screws with 1...2 Nm. Control lever to full-load stop; voltage value of 2.472... 2.532 V must be attained.

Pin projection = 16.60...16.70 mm

CORRECTION OF INJECTED-FUEL QUANTITY -Set max. change plus/minus 0.75 mm control-rod travel at correction screw on ALDA pressure box.

Note remarks

Test sheet

: 30.10.92 Edition

Replaces : 08.07.92 Test oil : ISO-4113

Combination no. : 0 400 076 992

Injection pump

Pump designation : PES6M55C32ORS157

EP type number : 0 410 056 993

Governor

Governor design. : RSF315/2300M64 : 0 420 021 044 Governer no.

Cust. part no. : T4

Customer-spec. information

Customer : MB-PKW

: 0M603A / ALDA Engine

1st version kW : 110.0

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 469 990 351

Inlet press., bar: 1.00

Test nozzle holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter

x Wall thickness

x Length mm : 6.00X2.00X600

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 2.20...2.30 Prestroke mm

: (2.15...2.35)

Rack travel in mm : 20.00...22.00

Firing order : 1-5-3-6-2-4

Phasina : 0-60-120-180-240-300

Tolerance + - \* : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed nom: 1000

Rack travel in mm : 13.90...14.00

Del.quantity cm3/: 5.1...5.2

100 s: (5.0...5.3)

Spread cm3 : 0.2

100 s: (0.3)

2nd speed rpm : 290.0

Rack travel in mm: 5.3...5.5

Del.quantity cm3/: 0.5...0.6 100 s: (0.5...0.9)

cm3 : 0.1Spread

100 s: (0.15)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rom : 1000

Aneroid pressure h: 1850

: 51.0...52.0 Del.quantity 1000 : (50.0...53.0)

: 2.50 Spread cm3

1000 : (3.00)

RATED SPEED

1st version

Control lever

position degrees: 50...0

3rd rack travel in: 8.1...8.5

rpm : 2500 Speed

4th rack travel in: 2950

: 0.00...1.00 Speed rom

SET IDLE CONTROL LEVER POSITION

: 1000 rpm

Rack travel in mm: 1.7...1.8

LOW IDLE 1

Control lever

Del.quantity cm3/: 48.5...50.5 1000 s: (47.5...51.5) position degrees: 8...12 Setting point w/out bumper spring Speed rom : 290 cm3 : 2.50 Spread Rack travel in mm: 5.4 1000 s: (3.00) Aneroid pressure h: 1050 Speed rpm : 1000 Del.quantity cm3/ : 33.0...34.0 1000 s: (32.0...35.0) Testing: Speed : 200 rpm Minimum rack trave: 7.00 : 290 rpm cm3 : 2.50Spread Rack travel in mm : 5.30...5.50 1000 s: (3.00) Rack travel in mm: 2.50 : 510...610 Speed rom rpm : 1000 Speed STARTING FUEL DELIVERY Maximum rack trave: 1.80 SET IDLE AUXILIARY SPRING rpm : 100 Specd rpm : 360 Speed Rack travel in mm : 4.20...4.40 : (4.10...4.50) Rack travel in mm : 20.10...0.00 TORQUE CONTROL HIGH IDLE Torque control curve - ist version rpm : 1000 1st speed 1st version Rack travel in m: 13.90...14.00 Aneroid pressure h: 1850 rpm : 1600 2nd speed Speed rpm : 2500 Rack travel in m: 13.20...13.40 Rack travel in mm : 8.10...8.50 3rd speed rpm : 2200 Del.quantity cm3/: 29.0...33.0 1000 s: (28.0...34.0) Rack travel in m: 12.30...12.50 cm3 : 2.50 Spread Aneroid/Altitude 1000 s: (3.00) Compensator Test LOW IDLE Speed rpm : 290
Rack travel in mm : 5.30...5.50
Del.quantity cm3/ : 5.5...6.5
1000 s: (5.0...9.5) 1st version Setting Speed COM : 1000 hPa : 1600 Pressure kack travel nm : 0.50...0.90 cm3 : 1.00 Spread 1000 s: (1.50) Measurement 1/min: 1000 Speed SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR) 1st pressure hPa : 1050 Rack travel in m: 3.90...4.10 2nd pressure hPa : 750 Control lever at idle stop Speed rpm : 315 Rack travel in mm : (12.8...14.2) Rack travel in m: 5.80...6.20 Del.quantity cm3/: -1000 s: (42.0...49.0) FUEL DELIVERY CHARACTERISTICS Current A 1st version Ameroid pressure h: 1850 Control lever at full-load stop Speed rpm : 1600 rpm : 2950 Del.quantity cm3/: 50.0...51.5 1000 s: (49.0...52.5) Rack travel in mm: 0.0...1.0 Current cm3 : 2.50Spread short-duration A: 3,0 1000 s: (3.00) Starting test Aneroid pressure h: 1850 Speed rpm Del.quantity cm3/: -min. 1000 s: 52.0 Speed : 2200 rpm min.

Remarks:

Sliding sleeve pre-travel = 6.5 mm

CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF
-Control-lever position 49°, max.
0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.
Control-lever position 46.5°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

CHECKING THE PNEUMATIC SHUTOFF BOX —Control lever up against idle stop. At n = 290 1/min and pu = 450 mbar control rod must move briskly to control—rod travel = 0 mm

Start-of-delivery sensor system: adjustment and blocking with device KDEF 1077 = 19.3°...19.7° (19.2...19.8°) angular displacement of cam following start of delivery of cylinder no. 1. Difference in start of delivery between max. and min. value = max. 1° angular displacement of cam

Testing and adjusting the control-rod-travel sensor with evaluation circuit KDEP-P4CO
Receiving inspection
Shift control lever to full-load stop.
Set 13.5 V at stabilizer. Apply 1850 hPa to ALDA. Run up to speed of 1000 1/min; a voltage of 2.472...2.532 (2.442...2.562) V must be displayed on the digital voltmeter.

Adjustment of the control-rod travel sensor

At a speed of 1000 1/min, set fuel delivery at 23.0...24.0 (22.0...25.0) ccm/1000 strokes with control lever. Shift control-rod-travel sensor until U = 1.633...1.639 (1.635...1.637) V is

indicated. Tighten fastening screws with 1...2 Nm. Control lever to full-load stop; voltage value of 2.472... 2.532 V must be attained.

Pin projection = 16.60...16.70 mm

CORRECTION OF INJECTED-FUEL QUANTITY -Set max. change plus/minus 0.75 mm control-rod travel at correction screw on ALDA pressure box.

Note remarks

Test sheet

: MB

Edition

: 30.10.92

Replaces

: 08.07.92

Test oil

: ISO-4113

Combination no.

: 0 400 076 996

Injection pump

Pump designation : PES6M55C32ORS155

EP type number

: 0 410 056 997

Governor

Governor design. : RSF315/2300M62

Governer no.

: 0 420 021 035

Cust. part no.

: T4

Customer-spec. information Customer

: MB-PKW

Engine

: 04603

1st version kW

: 80.0

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 469 990 351

Inlet press., bar: 1.00

Test nozzle holder

assembly

: 0 681 343 009

Opening.

pressure, bar

: 172...175

Test lines

: 1 680 750 014

Outside diameter

x Wall thickness

x Length mm

: 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm

: 2.00...2.10

: (1.95...2.15)

Spread

position degrees: 50...0

3rd rack travel in: 7.8...8.2

Speed

: 2500 rom

Speed

: 0.00...1.00

SET IDLE CONTROL LEVER **POSITION** 

Speed rpm : 1000

Rack travel in mm: 0.9...1.0

LOW IDLE 1

Control lever

position degrees: 13...17

N06

Rack travel in mm : 20.00...22.00

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance + - \* : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed

rpm: 1000

Rack travel in mm : 11.30...11.40

Del.quantity cm3/: 3.1...3.2

100 s: (3.0...3.3)

Spread cm3 : 0.2

100 s: (0.3)

2nd speed rpm : 290.0

Rack travel in mm : 5.4...5.6 Del.quantity cm3/: 0.5...0.6

100 s: (0.5...0.9)

cm3 : 0.1

100 s: (0.15)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Spread

Speed

rpm : 1000

: 31.5...32.5 Del.quantity

1000 : (30.5...33.5)

cm3 : 2.50

1000 : (3.00)

RATED SPEED

1st version

Control lever

4th rack travel in: 2950

rpm

Setting point w/out bumper spring Speed rom : 290 Rack travel in mm: 5.5 Testing: Speed rpm : 220 Minimum rack trave: 7.00 : 290 Speed mom Rack travel in mm : 5.40...5.60 Rack travel in mm : 1.50 : 620...720 Speed rom : 1000 Speed mom Maximum rack trave: 1.00 SET IDLE AUXILIARY SPRING : 360 COM Rack travel in mm : 4.20...4.40 : (4.10...4.50) TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1000 Rack travel in m: 11.30...11.40 and speed rpm : 1800 Rack travel in m: 10.90...11.10 2nd speed 3rd speed rpm : 2200 Rack travel in m: 10.60...10.80 FUEL DELIVERY CHARACTERISTICS 1st version : 1800 Speed rpm Del.quantity cm3/: 34.0...35.5 1000 s: (33.0...36.5) cm3 : 2.50 Spread 1000 s: (3.00) Speed rpm : 2200 Del.quantity cm3/: 33.5...35.5 1000 s: (32.5...36.5) cm3 : 2.50Spread 1000 s: (3.00) STARTING FUEL DELIVERY Speed : 100 rpm Del.quantity cm3/: 55.0...0.0 1000 s: (55.0...0.0)
Rack travel in mm: 20.10...0.00 HIGH IDLE 1st version rpm : 2500 Speed Rack travel in mm : 7.80...8.20

Spread cm3 : 2.501000 s: (3.00) LOW IDLE Speed rpm : 290
Rack travel in mm : 5.40...5.60
Del.quantity cm3/ : 5.5...6.5 1000 s: (5.0...9.5) Spread cm3 : 1.00 1000 s: (1.50) SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR) Control lever at idle stop : 315 Speed rom Rack travel in mm : (12.6...14.0) Del.quantity cm3/: -1009 s: (32.0...40.0) Current A Control lever at full-load stop Speed rpm : 2950 Rack travel in mm: 0.0...1.0 Current short-duration A: 3,0 Starting test rpm : 100 Speed Del.quantity cm3/: -min. 1000 s: 55.0 / 1.8A min. Remarks: Sliding sleeve pre-travel = 6.5 mm CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF -Control-lever position 49°, max. 0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min. Control-lever position 46.5°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam). CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position 35,5°, max. 0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min. -Control-lever position 33.0°, control-rod travel deduction must be greater than 0.2 mm after switchover

Del.quantity cm3/: 22.0...26.0

1000 s: (21.0...27.0)

point (of starting cam).

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 19.3°...19.7° (19.2...19.8°) angular displacement of cam following start of delivery of cylinder no. 1. Difference in start of delivery between max. and min. value = max. 1° angular displacement of cam

<u>Testing and adjusting the control-rod-travel sensor with evaluation circuit KDEP-P400</u>

Receiving inspection
Shift control lever to full-load stop.
Set 13.5 V at stabilizer. Apply
1850 hPa to ALDA. Run up to speed of
1000 1/min; a voltage of 2,043...2,103
(2,013...2,132) V must be displayed
on the digital voltmeter.

## Adjustment of the control-rod travel sensor

At a speed of 1000 1/min, set fuel delivery at 18,0...19,0 (17,0...20,0) ccm/1000 strokes with control lever. Shift control-rod-travel sensor until U = 1.633...1.639 (1.635...1.637) V is indicated. Tighten fastening screws with 1...2 Nm. Control lever to full-load stop; voltage value of 2.487... 2.547 V must be attained.

Note remarks

Test sheet : FIA : 21.09.92 Edition

Replaces

: ISO-4113 Test oil

: 0 400 846 599 Combination no.

Injection pump

Pump designation : PES6A90D410RS2817 EP type number : 0 410 896 090

Governor

: RQV300...1100AB1262-Governor design.

: 0 420 212 235 Governer no.

Customer-spec. information Customer : IVECO-FIAT

Engine : 8365.25.513

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 419 992 198

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

Openina

pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter x Wall thickness

x Length mm : 5.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.75...2.85 : (2.70...2.90)

Rack travel in mm : 9.00...12.00

: 1-5-3-6-2-4 Firing order

Phasing : 0-60-120-180-240-300

Tolerance + - \* : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1100

Rack travel in mm : 11.30...11.40

Del.quantity cm3/: 8.1...8.2

100 s: (7.9...8.4)

Spread cm3 : 0.3

100 s: (0.4)

rpm : 300.02nd speed Rack travel in mm : 7.5...7.7 Del.quantity cm3/: 0.8...1.2

100 s: (0.6...1.4)

Spread cm3 : 0.2100 s: (0.4)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 0.80...1.30 2nd speed rpm : 480

travel ma : 2.10...2.60

3rd speed rpm : 530

travel mm : 2.60...3.10

4th speed rpm : 615

travel mm : 3.20...3.70

5th speed rpm : 1150

travel mm : 8.10...8.60

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1250 Speed Rack travel in mm : 9.10...11.70

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Del.quantity : 81.5...82.5

1000 : (79.5...84.5) : 3.00 Spread cm3

: (4,50) 1000

RATED SPEED

1st version

Control lever

position degrees: 117...125

Testing:

1st rack travel in: 10.40

rpm : 1140...1150 Speed

2nd rack travel in: 4.00

Speed rpm : 1225...1255 4th rack travel in: 1350

rpm : 0.00...1.00Speed

LOW IDLE 1

Control lever

position degrees: 56...74

Testina:

Speed rpm : 200

Minimum rack trave: 8.40

rpm : 300

Rack travel in mm : 7.50...7.70

CONSTANT REGULATION

rpm : 425...575 Speed

TORQUE CONTROL

Dimension a mm : 0.80

Torque control curve - 1st version

rpm : 1100 1st speed

Rack travel in m: 11.30...11.40

2nd speed rpm : 500

Rack travel in m: 12.10...12.20

3rd speed rpm : 880

Rack travel in m: 11.80...12.00

4th speed nom : 990

Rack travel in m: 11.40...11.70

FUEL DELIVERY CHARACTERISTICS

1st version

: 700 Speed rpm

Del.quantity cm3/: 84.0...86.0

1000 s: (81.5...88.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.40

rpm : 1140...1150 Speed

STARTING FUEL DELIVERY

Speed rom : 100 Del.quantity cm3/: 159.0...169.0 1000 s: (156.0...172.0)

Rack travel in mm: 19.50...21.00

Remarks:

Check electrically unlatched starting fuel delivery (EES) with 24 volt.

On activation of the starting solenoid, the start position must be reached.

Note remarks

Test sheet : MWM

Edition : 23.10.92

Replaces

Test oil : ISO-4113

: 0 400 864 094 Combination no.

Injection pump

Pump designation: PES4A90D320/3RS2743

EP type number : 0 410 894 034

Governor

Governor design. : RSV325...1150A5c505-

5R

: 0 420 233 289 Governer no.

Customer-spec. information Customer : 19414

Engine : TD226B-4

1st version kW : 63.0 Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 2.95...3.05 Prestroke mm

: (2.90...3.10)

Rack travel in mm : 9.00...12.00

: 1-3-4-2 Firing order

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...0.00

& maximum rack tra: 21.00 Difference CS: 3.50...4.50

BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 9.50...9.60

Del.quantity cm3/: 7.1...7.2

100 s: (6.9...7.4)

cm3 : 0.3Spread

100 s: (0.5)

2nd speed rpm : 325.0

Rack travel in mm: 6.7...6.9 Del.quantity cm3/: 0.9...1.5

100 s: (0.7...1.7)

Spread cm3 : 0.2

100 s: (0.4)

GUIDE SLEEVE FOSITION Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm: 0.30...0.70

Governor spring pre-tension

Click setting  $\bar{x}$ : 3.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

: 71.5...72.5 Del.quantity

1000 : (69.5...74.5)

: 3.00 Spread cm3

: (5.00) 1000

RATED SPEED

1st version

Control lever

position degrees: 96...104

Testing: 1st rack travel in: 8.50 Speed rpm : 1190...1200 2nd rack travel in: 4.00 rpm : 1210...1240 Speed 3rd rack travel in: 4.00 Speed rpm : 1240...1270 4th rack travel in: 1330 rpm : 0.30...1.40 Speed LOW IDLE 1 Control lever position degrees: 66...74 Setting point w/out bumper spring Speed rpm : 325 Rack travel in mm: 6.3 Testing: Speed rpm : 100 Minimum rack trave: 19.50 Speed rpm : 325 Rack travel in mm : 6.70...6.90 Rack travel in mm : 2.00 Speed rom : 430...490 TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1150 Rack travel in m: 9.50...9.60 2nd speed rpm : 500 Rack travel in m: 9.50...9.70 FUEL DELIVERY CHARACTERISTICS 1st version nom: : 500 Speed Del.quantity cm3/: 52.0...54.0 1000 s: (49.5...56.5) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 8.50 Speed rpm : 1190...1200 STARTING FUEL DELIVERY Remarks:

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**APPLICATION** 

Excavator

Note remarks

Test sheet : MWM 6,2 e 6 Edition : 23.10.92

Replaces : 05.90 Test oil : ISO-4113

Combination no. : 0 400 866 122

Injection pump

Pump designation : PES6A90D320/3RS2660

EP type number : 0 410 896 078

Governor

Governor design. : RSV325...1200AUC2182

-3R

Governer no. : 0 420 233 212

Customer—spec. information Customer : MWH4

edstoner . Payri

Engine : TD2268-6

1st version kW : 123.0 Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 419 992 198

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

Opening

pressure, bar : 172...175

Test Lines : 1 680 750 014

Outside diameter x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY Test pressure, bar: 25...27

Prestroke mm : 2.95...3.05

: (2.90...3.10)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance + - \* : 0.50 (0.75)

Time to cyl. no. : -1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50

& maximum rack tra: 21.00

Difference ° CS : 3.50...4.50

BASIC SETTING

1st speed rpm: 1180

Rack travel in mm : 11.60...11.70

Del.quantity cm3/: 8.9...9.0

100 s: (8.7...9.2)

Spread cm3 : 0.3

100 s: (0.4)

2nd speed rpm : 325.0 Rack travel in mm : 7.1...7.3

Rack travel in mm : 7.1...7.3 Del.quantity cm3/ : 1.0...1.6

100 s: (0.8...1.8)

Spread cm3 : 0.2

100 s: (0.4)

GUIDE SLEEVE POSITION
Control - Lever position

Control-lever position
Degree: -3

Speed rpm: 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : 3.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1180 Aneroid pressure h: 700

Deliquentity : 89.0...90.0

etiquantity : 89.0...90.0 1000 : (87.0...92.0)

Spread cm3 : 3.00

1000 : (4.50)

RATED SPEED

1st version

Control lever

position degrees: 90...98

Testina:

1st rack travel in: 10.60

rpm : 1220...1230 Speed

2nd rack travel in: 4.00

rpm : 1240...1270 Speed

3rd rack travel in: 4.00

rpm : 1260...1290 Speed

4th rack travel in: 1435

rpm : 0.30...1.40 Speed

LOW IDLE 1

Control Lever

position degrees: 63...71

Setting point w/out bumper spring

rpm : 325 Rack travel in mm: 6.7

Testina:

Speed : 100 rpm

Minimum rack trave: 19.50

Speed rpm : 325

Rack travel in mm : 7.10...7.30

Rack travel in mm : 2.00

Speed rpm : 485...545

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1180

Rack travel in m: 11.60...11.70 d speed rpm : 700

2nd speed rpm

Rack travel in m: 12.40...12.50

Aneroid/Altitude

Compensator Test

1st version

Setting

: 500 Speed rem hPa : 700 Pressure

Rack travel mm : 12.40...12.50

Measurement

Speed  $1/\min : 500$ 

1st pressure hPa : -

Rack travel in m: 10.40...10.50

2nd pressure hPa : 320

Rack travel in m: 11.80...11.90

3rd pressure hPa : 180

Rack travel in m: 11.00...11.20

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700

N14

: 700 Speed rpm

Del.quantity cm3/: 93.0...95.0 1000 s: (90.5...97.5)

Ameroid pressure h: -

Speed rpm : 500 Del.quantity cm3/ : 61.0...62.0

1000 s: (59.0...64.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 10.60

Speed rpm : 1220...1230

STARTING FUEL DELIVERY

Speed : 100 rpm

Del.quantity cm3/: 128.0...138.0

1000 s: (125.0...141.0)

Rack travel in mm : 19.50...21.00

:

Remarks:

**APPLICATION** 

Tractor (tractor engines)

Note remarks

: CUM Test sheet

Edition : 23.10.92

Replaces

Test oil : ISO-4113

Combination no. : 0 400 866 178

Injection pump

Pump designation : PES6A100D320/3RS2691

EP type number : 9 410 230 025

Governor

Governor design. : RSV550...1100A0c2190

-56R

: 0 420 233 295 Governer no.

Customer-spec, information Customer : C.D.C.

Engine : 6CTA-830

1st version kW : 157.0 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

assembly : 1 688 901 101

Openina

pressure, bar : 207...210

Orifice plate

diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter

x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm

: 2.80...2.90 : (2.75...2.95)

Rack travel in mm : 9.00...12.00

Firing order

: 1-5-3-6-2-4

Phasing

: 9-60-120-180-240-300

Tolerance + - \*

: 0.50 (0.75)

Time to cyl. no.

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 12.70...12.80

Del.quantity cm3/: 12.3...12.5

100 s: (12.1...12.7)

Spread cm3 : 0.4

100 s: (0.6)

rpm : 550.0 2nd speed

Rack travel in mm: 5.6...5.8 Del.quantity cm3/ : 1.6...2.0

100 s: (1.3...2.2)

cm3 : 0.6Spread

100 s: (0.8)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

rpm : 800 Speed

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 3.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Del.quantity : 123.0...125.0

1000 : (121.0...127.0)

: 4.00 Spread cm3

1000 : (6.50)

RATED SPEED

1st version

Control lever

position degrees: 43...51

Testing:

1st rack travel in: 11.70

Speed rpm : 1165...1175

2nd rack travel in: 4.00

\_ Speed rpm : 1225...1235

3rd rack travel in: 4.00

Speed rpm : 1225...1255

4th rack travel in: 1400

Speed rpm : 0.30...1.40

LOW IDLE 1

Control Lever

position degrees: 25...33

Setting point w/out bumper spring

Speed rpm : 550 Rack travel in mm : 5.2

Testing:

Speed rpm : 100 Minimum rack trave: 19.00

Speed rpm : 550

Rack travel in mm : 5.60...5.80

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 11.70

**Speed** rpm : 1165...1175

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 135.0...155.0

1000 s: (130.0,..160.0)

Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 550

Rack travel in mm : 5.60...5.80 Del.quantity cm3/ : 16.0...20.0

1000 s: (13.5...22.5)

Spread cm3:6.00

1000 s: (8.00)

Remarks:

: C.D.C. # 3923480

Limit shutoff stop screw to 1.0 mm.

Start-of-delivery mark 11° cam angle after start of delivery cyl. 1

Note remarks

: LIE 5,6 a15 Test sheet Edition : 23.10.92

: 02.92 Replaces Test oil : ISO-4113

Combination no. : 0 400 874 238R

Injection pump

Pump designation : PES4A95D410RS2685 EP type number : 0 410 894 996

Governor

Governor design. : RSV400...1000A1c2187

: 0 420 232 387 Governer no.

Customer-spec. information Customer : LIEBHERR

: 0904 T Engine

1st version kW : 90.0 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 419 992 198

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY Test pressure, bar: 25...27

Prestroke mm : 2.70...2.80

: (2.65...2.85)

Rack travel in mm : 9.00...12.00

Firing order : 1-3-4-2

: 0-90-180-270 Phasing

Tolerance + - \* : 0.50 (0.75)

BEGINNING OF DELIVERY DIFFERENCE

betw. rack tray. m: 8.50...9.50

& maximum rack tra: 21.00

Difference \* CS : 4.00...5.00

BASIC SETTING

rpm: 975 1st speed

Rack travel in nm : 12.20...12.30

Del.quantity cm3/: 11.9...12.1

100 s: (11.7...12.3)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 415.0

Rack travel in mm: 6.6...6.8 Del.quantity cm3/: 1.7...2.1

100 s: (1.4...2.3)

cm3 : 0.3Spread

100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm: 0.30...0.70

Governor spring pre-tension Click setting x : 2.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 975

: 119.0...121.0 Del.quantity 1000 : (117.0...123.0)

Spread cm3: 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 90...98

Testing: 1st rack travel in: 11.20 rpm : 1020...1030 Speed 2rd rack travel in: 4.00 rpm : 1030...1060 Speed 3rd rack travel in: 4.00 Speed rpm : 1070...1090 4th rack travel in: 1230 rpm : 0.30...1.40 Speed LOW IDLE 1 Control lever position degrees: 65...73 Setting point w/out bumper spring Speed rpm : 415 Rack travel in mm: 6.2 Testing: rpm : 100 Speed Minimum rack trave: 19.50 rpm : 415 Speed Rack travel in mm : 6.60...6.80 Rack travel in mm: 2.00 Speed rom : 535...595 TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 975 Rack travel in m: 12.20...12.30 2nd speed rpm : 500 Rack travel in m: 12.80...13.00 3rd speed rpm : 800 Rack travel in m: 12.80...13.00 4th speed rpm : 900 Rack travel in m: 12.40...12.60 FUEL DELIVERY CHARACTERISTICS 1st version Speed : 500 rpm Del.quantity cm3/: 114.0...120.0 1000 s: (111.5...122.5) Speed : 800 man Del.quantity cm3/: 125.5...128.5 1000 s: (123.0...131.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 11.20 Speed rpm : 1020...1030 STARTING FUEL DELIVERY

Speed

N18

rom .

: 100

Del.quantity cm3/: 120.0...130.0 1000 s: (117.0...133.0)

Rack travel in mm : 19.50...21.00

LOW IDLE

Speed rpm : 415

Rack travel in mm : 6.60...6.80 Del.quantity cm3/ : 17.0...21.0 1000 s: (14.5...23.5)

:

Spread cm3 : 3.50 1000 s: (5.50)

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS Prestroke mm : 2.50...2.60 : (2.45...2.65) Rack travel in mm : 9.00...12.00 Firing order : 1-3-4-2 Note remarks Test sheet : KI O Edition : 30.10.92 Replaces Test oil : ISO-4113 Phasing : 0-90-180-270 Combination no. : 0 400 874 253 Tolerance + - \* : 0.50 (0.75) Injection pump BASIC SETTING Pump designation : PES4A85D410/3RS2799-1st speed rpm : 1050 EP type number : 0 410 884 941 Governor Rack travel in mm : 11.50...11.60 Governor design. : RSV325...1150A8c2239 -6L Del.quantity cm3/ : 7.9...8.0 Governer no. : 0 420 232 582 100 s: (7.7...8.2) Customer-spec, information Customer : KHD cm3 : 0.3Spread : BF4L913 Engine 100 s: (0.5) 1st version kW : 70.0 2nd speed rpm : 325.0 : 2300 Rated speed Rack travel in mm: 7.5...7.7 Del.quantity cm3/: 1.2...1.8 TEST BENCH REQUIREMENTS 100 s: (1.0...2.0) Spread cm3 : 0.2Test oil 100 s: (0.4) inlet temp. °C : 38...42 GUIDE SLEEVE POSITION Overflow valve Control-lever position : 1 419 992 198 Degree: -3 rpm : 800 Speed Inlet press., bar: 1.50 Rack travel in mm : 0.30...0.70 Test nozzle holder Governor spring pre-tension : 0 681 343 009 assembly Click setting  $\bar{x}$ : 4.25 Opening FULL LOAD DELIV. AT FULL LOAD STOP pressure, bar : 172...175 1st version rpm : 1050 Speed Test lines : 1 680 750 014 : 79.5...80.5 Del.quantity 1000 : (77.5...82.5) Outside diameter cm3 : 3.00 Spread x Wall thickness 1000 : (5.00) : 6.00x2.00x600 x Length mm RATED SPEED (A) Injection pump setting values Insp. values in parentheses 1st version Set equal delivery quant. Control lever per values position degrees: 97...105 BEGINNING OF DELIVERY Testing: Test pressure, bar: 25...27 1st rack travel in: 10.50 rpm : 1090...1100 Speed

2nd rack travel in: 4.00

: 1120...1150 Speed rom 3rd rack travel in: 4.00 Speed rpm : 1145...1175 4th rack travel in: 1330 Speed rpm : 0.30...1.40 LOW IDLE 1 Control Lever position degrees: 66...74 Setting point w/out bumper spring Speed rpm : 325 Rack travel in mm : 7.1 Testing: Speed (TOM : 100 Minimum rack trave: 19.50 rpm : 325 Rack travel in mm: 7.50...7.70 Rack travel in mm: 2.00 rpm : 435...495 Speed TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1050 Rack travel in m: 11.50...11.60 2nd speed rpm : 730 Rack travel in m: 12.10...12.20 3rd speed rpm : 885 Rack travel in m: 11.70...11.90 FUEL DELIVERY CHARACTERISTICS 1st version Speed rpm : 730 Del.quantity cm3/: 79.0...81.0 1000 s: (76.5...83.5) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 10.50 Speed rpm : 1090...1100 STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/: 120.0...130.0 1000 s: (117.0...133.0) Rack travel in mm : 17.60...18.00 Remarks: **APPLICATION** Excavator

: 1- 5- 4- 8- 6- 3- 7- 2 BOSCH INJ. PUMP TEST SPECIFICATIONS Firing order Note remarks : STE 12.0 h : 23.10.92 : 07.91 Test sheet Edition Phasing : 0-45-90-135-180-225-Replaces 270-315 Test oil : ISO-4113 Tolerance + - ° : 0.50 (0.75) Combination no. : 0 401 838 709 Time to cyl. no. : 1 Injection pump BASIC SETTING Pump designation : PE8P110A120LS3271 EP type number : 0 411 818 723 1st speed rpm: 1100 Governor Governor design. : RQV250...1100PA951-2 Rack travel in mm : 13.40...13.50 Governer no. : 0 421 813 908 Del.quantity cm3/: 17.4...17.6 Customer—spec. information Customer : HAEP 100 s: (17.1...17.9) Engine : WD815.66 cm3 : 0.4Spread 1st version kW : 270.0 100 s: (0.7) : 2200 Rated speed 2nd speed rpm : 250.0 TEST BENCH REQUIREMENTS Rack travel in mm: 4.1...4.3 Del.quantity cm3/: 1.7...2.3 100 s: (1.5...2.5) Test oil inlet temp. °C : 38...42 cm3 : 0.4Spread 100 s: (0.7) Overflow valve : 1 417 413 025 (B) Setting of injection pump with governor Inlet press., bar: 1.50 GUIDE SLEEVE TRAVEL Test nozzle holder rpm : 250 1st speed : 0 681 343 009 assembly : 0.90...1.30 travel mm : 485 2nd speed rpm Opening . : 3.20...3.80 travel mm pressure, bar : 172...175 3rd speed rpm : 640 : 4.20...4.80 travel mm 4th speed rpm : 1145 Test lines : 1 680 750 015 : 8.40...8.60 travel mm : 1220 5th speed rpm Outside diameter : 9.80...10.20 travel mm x Wall thickness : 6.00X1.50X600 x Length mm GUIDE SLEEVE POSITION Control-lever position (A) Injection pump setting values Degree: -1 rpm : 1130 Insp. values in parentheses Speed Set equal delivery quant. Rack travel in mm : 15.20...17.80 per values FULL LOAD DELIV. AT FULL LOAD STOP BEGINNING OF DELIVERY Test pressure, bar: 25...27 1st version Speed rpm : 1100 Prestroke mm : 2.80...2.90 Aneroid pressure h: 1200 Del.quantity : 1/4.0....179.0)

: (2.75...2.95)

Rack travel in mm : 9.00...12.00

: 4.00 Spread cm3 1000 : (7.50)

RATED SPEED

1st version Control lever

position degrees: 114...122

Testing:

1st rack travel in: 12.40 rpm : 1140...1150 Speed

2nd rack travel in: 4.00 Speed

rpm : 1210...1240 4th rack travel in: 1350

Speed rpm : 0.00...1.00

LOW IDLE 1 Control lever

position degrees: ?

Testing:

rpm : 100 Speed Minimum rack trave: 4.60 Speed TCM)

Rack travel in mm : 4,10...4.30

CONSTANT REGULATION

rpm : 250...390 Speed

TORQUE CONTROL

Dimension a mm

Torque control curve - 1st version

1st speed rpm : 1100

Rack travel in m: 13.40...13.50

2nd speed rpm : 600

Rack travel in m: 13.40...13.60

Aneroid/Altitude Compensator Test

1st version

Setting

: 500 Speed rpm hPa : 1200 Pressure

Rack travel mm : 13.40...13.50

Measurement

1/min : 500 Speed

1st pressure hPa : -

Rack travel in m: 9.90...10.10

2nd pressure hPa : 600

Rack travel in m: 12.50...12.60 3rd pressure hPa : 380 Rack travel in m: 10.40...10.60

START CUT-OUT

Speed  $1/\min$ : 170 (190)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200

Speed : 600 rpm

Del.quantity cm3/: 186.0...190.0

1000 s: (183.0...193.0)

Aneroid pressure h:

Speed rpm : 500 Del.quantity cm3/ : 117.0...119.0

1000 s: (114.0...122.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 12.40

rpm : 1140...1150 Speed

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 220.0...260.0

1000 s: (215.0...264.0)

Rack travel in mm : 20.00...21.00

Remarks:

Note remarks

Test sheet : KHD 19,2 a4 Edition : 09.06.89

Replaces

Test oil : ISO-4113

Combination no. : 0 401 840 766

Injection pump

Pump designation : PE12P110A920LS3173

EP type number : 0 411 810 708

Governor

Governor design. : RQV475...1075PA907-1

Governer no. : 0 421 813 739

Customer-spec. information Customer : KHD

Engine : BF12L513C

1st version kW : 333.0 Ratted speed : 2150

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

Openina

pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter x Wall thickness

x Length mm : 6.00x1.50x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

: 2.80...2.90 Prestroke mm

: (2.75...2.95)

Rack travel in mm : 9.00...12.00

Firing order : 1- 4- 9- 8- 5- 211- 10- 3- 6- 7- 12

Phasing : 0-15-60-75-120-135-

180-195-240-255-300-

315

: 0.50 (0.75) Tolerance + - \*

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1075

Rack travel in mm : 11.70...11.80

Del.quantity cm3/: 13.4...13.6

100 s: (13.2...13.8)

Spread cm3 : 0.5

100 s: (0.8)

2nd speed rpm : 475.0 Rack travel in mm: 6.6...6.8

Del.quantity cm3/: 1.7...2.3 100 s: (1.4...2.5)

Spread cm3 : 0.7

100 s: (1.0)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

rpm : 475 1st speed

: 1.10...1.50 travel mm

2nd speed rpm : 650

travel mm : 3.40...4.00

rpm : 950 3rd speed

travel mm : 5.60...6.20

: 1100 4th speed rpm

: 7.70...7.90 travel mm

: 1150 5th speed rpm

: 8.80...9.20 travel mm

GUIDE SLEEVE POSITION

Control-lever position Degree: -1

rpm : 1120 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1075

Speeu Del.quantity 1000 : 134.0...136.0

: (132.0...138.0)

Spread

cm3 : 5.00

1000 : (8.00)

RATED SPEED

1st version

Control lever

position degrees: 49...57

Testina:

1st rack travel in: 10.70

rpm : 1095...1105 Speed

2nd rack travel in: 4.00

rom : 1135...1165 Speed

4th rack travel in: 1250

Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever

position degrees: 20...28

Testing:

Speed rpm : 100

Minimum rack trave: 8.20

nom : 475

Rack travel in mm : 6.60...6.80

CONSTANT REGULATION

Speed rom : 475...640

TORQUE CONTROL

: 0.60 Dimension a mm

Torque control curve - 1st version

rpm : 1075 1st speed

Rack travel in m: 11.70...11.80

rpm : 800 2nd speed

Rack travel in m: 12.30...12.50

3rd speed rpm : 950

Rack travel in m: 11.90...12.10

START CUT-OUT

1/min: 395 (415) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Speed : 800 rom

Del.quantity cm3/: 143.0...147.0 1000 s: (141.0...149.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.70

rpm : 1095...1105 Speed

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quantity cm3/: 135.0...165.0 1000 s: (131.0...169.0)

Remarks:

Check electrically unlatched starting fuel delivery (EES) with 24 volt.

On activation of the starting solenoid, the start position must be reached.

BOSCH INJ. PUMP TEST SPECIFICATIONS : 4.20...4.30 Prestroke mm : (4.15...4.35) Note remarks Rack travel in mm : 9.00...12.00 Firing order : 12- 1- 5- 9- 8- 3-Test sheet : MAN 4- 11- 10- 2- 6- 7 : 21.06.91 Edition Replaces Test oil : ISO-4113 Phasina : 0-45-60-105-120-165-180-225-240-285-300-Combination no. : 0 401 840 770 Phasina : 345 Injection pump Tolerance + - \* : 0.50 (0.75) Pump designation: PE12P12OA520/4LS3854 EP type number : 0 411 826 728 Time to cyl. no. : 12 Governor Governor design. : RQ750PA947-1 BASIC SETTING Governer no. : 0 421 801 587 1st speed rom: 700 Customer-spec. information Customer : MAN Rack travel in mm : 13.00...13.10 Engine : D2842LE 21 Del.quantity cm3/: 25.0...25.2 1st version kW : 443.0 100 s: (24.7...25.5) : 1500 Rated speed Spread cm3 : 0.6TEST BENCH REQUIREMENTS 100 s: (1.0) Test oil inlet temp. °C : 38...42 rpm : 300.0 2nd speed Rack travel in mm: 4.4...4.6 Overflow valve Del.quantity cm3/: 1.7...2.3 : 1 417 413 025 100 s: (1.4...2.6) Spread cm3 : 1.0 Inlet press., bar: 1.50 100 s: (1.4) Test nozzle holder FULL LOAD DELIV. AT FULL LOAD STOP assembly : 1 688 901 019 1st version Opening Speed rpm : 700 pressure, bar : 207...210 Del.quantity : 250.0...252.0 1000 : (247.0...255.0) Orifice plate : 6.00 Spread cm3 diameter mm : 0,8 1000 : (10.00) RATED SPEED Test lines : 1 680 750 067 1st version Outside diameter x Wall thickness Testing: x Length mm : 6.00x1.50x1000 1st rack travel in: 12.00 rpm : 750...755 Speed (A) Injection pump setting values 2nd rack travel in: 4.00 : 790...803 Insp. values in parentheses Speed LDU Set equal delivery quant. 4th rack travel in: 950 per values Speed rpm : 0.00...1.00

Remarks:

: MAN-NR. 2-7981

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

APPLICATION

Generator set

Note remarks

Test sheet : PEN 12,2 a : 23.10.92 Edition : 02.88 Replaces

: ISO-4113 Test oil

Combination no. : 0 401 846 882

Injection pump

Pump designation : PE6P120A320RS3206-1

EP type number : 0 411 826 775

Governor

Governor design. : RQ750PA783-1 Governer no. : 0 421 801 432

Customer-spec. information

: VOLVO-PENTA Customer

: TAMD 122 A Engine

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 1 688 901 019

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter

x Wall thickness

x Length mm : 6.00x1.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.50...3.60

: (3.45...3.65)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rom: 700 1st speed

Rack travel in mm: 12.70...12.80

Del.quantity cm3/: 30.9...31.1

100 s: (30.6...31.4)

Spread cm3 : 0.5

100 s: (0.9)

rpm : 300.02nd speed Rack travel in mm: 4.9...5.1

Del.quantity cm3/: 1.7...2.3 100 s: (1.4...2.6)

cm3 : 0.5Spread

100 s: (0.8)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

mpm : 700 Skeed

: 309.0...311.0 Del.quantity

1000 : (306.0...314.0)

cm3 : 5.00 Spread

1000 : (9.00)

RATED SPEED

1st version

Testing:

1st rack travel in: 11.70 Speed rpm : 747...752 2nd rack travel in: 4.00

rpm : 774...789 Speed

4th rack travel in: 850

rpm : 0.00...1.00Speed

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.70

rpm : 747...752 Speed

Remarks:

APPLICATION

Generator set